



AFM-16-50041101  
REV 1.4

# ATTACK FROM MARS™ REMAKE



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Models: 12000-CE, 12000-SE, 12000-LE

## **Operations Manual Includes:**

Operations & Adjustments • Testing & Problem Diagnosis • Parts Information • Reference Diagrams & Schematics



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DIP SWITCH CHART

COUNTRY	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
AMERICA	OFF	OFF	ON	ON	ON	ON	ON	ON
EUROPEAN	OFF	OFF	ON	ON	ON	OFF	ON	ON
FRENCH	OFF	OFF	ON	ON	ON	ON	OFF	OFF
GERMAN	OFF	OFF	ON	ON	ON	ON	ON	OFF
SPAIN	OFF	OFF	ON	ON	OFF	ON	ON	ON

Attack From Mars Solenoid - Flasher Table							
WMS#	Solenoids	Driver Brd	FET#	Con.	FUSE	WIRE COLOR	PART#
01	AUTO PLUNGER	SP	Q101	J116p1	F103	VIO-WHT	AE-23-800
02	ROUGH EJECT	SP	Q102	J116p2	F103	VIO-RED	AE-26-1500
03	LEFT POPPER	SP	Q103	J116p3	F103	VIO-ORG	AE-26-800
04	RT POPPER	SP	Q104	J116p4	F103	VIO-YEL	AE-25-1000
05	LEFT ALIEN LOW	SP	Q105	J116p6	F103	VIO-GRN	AE-26-1500
06	LEFT ALIEN HIGH	SP	Q106	J116p7	F103	VIO-BLU	AE-26-1500
07	KNOCKER	SP	Q107	J115p2	F103	BRN	AE-23-800
08	RT ALIEN HIGH	SP	Q108	J116p9	F103	VIO-BLK	AE-26-1500
09	LEFT SLINGSHOT	SP	Q109	J113p1	F107	BRN-BLK	AE-26-1200
10	RT SLINGSHOT	SP	Q110	J113p2	F102	BRN-RED	AE-26-1200
11	LEFT JET	SP	Q111	J113p4	F102	BRN-ORG	AE-26-1200
12	BOTTOM JET	SP	Q112	J113p5	F102	BRN-YEL	AE-26-1200
13	RIGHT JET	SP	Q113	J113p6	F102	BRN-GRN	AE-26-1200
14	RT ALIEN LOW	SP	Q114	J113p7	F102	BRN-BLU	AE-26-1500
15	SAUCER SHAKE	SP	Q115	J113p8	F107	BRN-VIO	AE-26-1500
16	DROP TARGET	SP	Q116	J113p9	F107	BRN-WHT	AE-26-1200
FLASHERS							
17	RIGHT RAMP HIGH BB Insert	PF	Q40A	J12 p5		PIN-PCB-TWSFLSH PIN-PCB-BBFLASH	
18	RIGHT RAMP LOW BB Insert	PF	Q40B	J12 p6		PIN-PCB-TRUFLSH PIN-PCB-BBFLASH	
19	RIGHT SIDE HIGH BB Insert	PF	Q41A	P96 p4		PIN-PCB-TWSFLSH PIN-PCB-BBFLASH	
20	RIGHT SIDE LOW	PF	Q41B	P97 p4		PIN-PCB-TWSFLSH	
21	CENTER ARROW	PF	Q42B			PIN-PCB-TRUFLSH	
22	JETS	PF	Q33A	PL71		PIN-PCB-TWSFLSH	
23	SAUCER DOME	PF	Q43A	J14 p7		PIN-PCB-TWSFLSH	
24	MOTOR BANK	PF	Q51	P97		PIN-PCB-MOTFLSH	
25	LEFT RAMP LEFT BB Insert	PF	Q46A	J6p10		PIN-PCB-TWSFLSH PIN-PCB-MARFLSH	
26	LEFT RAMP RIGHT BB Insert	PF	Q46B	J4	J4	WHT-ORG	AE-27-1200
27	LEFT SIDE HIGH BB Insert	PF	Q47A	J9 Pin2		BLU-BLK	PIN-A-14406
28	LEFT SIDE LOW	PF	Q47B	PL5		BLU-YEL	PIN-A-14406
33	RIGHT GATE	PF	Q48A	J6 Pin9	F1	BLU-YEL	PIN-A-14406
34	LEFT GATE	PF	Q48B	J6 Pin10	F1	BLU-YEL	PIN-A-14406
37	LED CLOCK	PF	U10p6	J14 p3			
38	LED R DATA	PF	U10p8	J14 p4			
	LED G DATA	PF	U10p12	J14 p6			
	LED B DATA	PF	U10p10	J14 p5			
39	STROBE LIGHT	PF	Q49B	J14 p8			
FLIPPERS							
29	FLIPPER RIGHT POWER	1	Q124	J119	F116	GRA-RED	FL-11629
30	FLIPPER RIGHT HOLD	1	Q131	J119	F116	GRA-BLK	Blue
31	FLIPPER LEFT POWER	1	Q125	J119	F115	GRA-YEL	FL-11629
32	FLIPPER LEFT HOLD	1	Q132	J119	F115	GRA-WHT	Blue
33	NU	3	Q126	J120	F118	BRN	FL-11753
34	NU	3	Q134	J120	F118	BLU	Yellow
35	DIVERTER POWER	2	Q128	J120	F117	BRN	FL-11753
36	DIVERTER HOLD	2	Q136	J120	F117	BLU	Yellow
GENERAL ILLUMINATION							
01	BOTTOM PLAYIELD	PF	Q42A	P93 P93B		WHT-BRN	PIN-LMP-GILEDWW
02	MIDDLE PLAYIELD	PF	Q42B	P94 P94B		WHT-ORG	PIN-LMP-GILEDWW
03	TOP PLAYIELD	PF	Q43A	P95 P95B		WHT-YEL	PIN-LMP-GILEDWW
04	TOP INSERT	CONTRLR	Q5A	J4 P9		RED-GRN	PIN-PCB-24LEDBR
05	BOTTOM INSERT	CONTRLR	Q7A	J4 P13		BLK-YEL	PIN-PCB-24LEDBR

## **EPILEPSY WARNING**

A very small portion of the population has a condition which may cause them to experience epileptic seizures or have momentary loss of consciousness when viewing certain kinds of flashing lights or patterns that are commonly present in our daily environment. These persons who may never have experienced any such symptoms before may experience seizures while watching some kinds of television pictures or playing certain amusement games or witnessing certain flashing light patterns. We recommend that parents observe their children while they play this game. If you or your child experience any of the following symptoms: dizziness, altered vision, eye or muscle twitching, involuntary movements or disorientation, DISCONTINUE USE IMMEDIATELY and consult your physician.

## **ATTENTION : RISQUE D'EPILEPSIE**

Certaines personnes sont prédisposées aux crises d'épilepsies ou aux pertes de conscience momentanées quand elles regardent certains flashes lumineux ou images que l'on trouve régulièrement dans notre environnement quotidien. Ces personnes, qui n'ont peut-être jamais développé ces symptômes auparavant, peuvent être sujettes à des crises en regardant la télévision, en jouant sur certains jeux d'amusements ou en subissant certains types de flashes lumineux. Nous recommandons donc aux parents de surveiller leurs enfants lorsqu'ils jouent sur ce jeu. Si vous ou vos enfants développez les symptômes suivants : sensation de vertige, trouble de la vision, convulsion, mouvement involontaire ou désorientation, ARRETEZ IMMEDIATEMENT L'UTILISATION et consultez votre médecin.

## **EPILEPSY WARNING**

In sehr seltenen Faellen kann es bei zu Epilepsie neigenden Personen zu Bewusstseinsstoerungen beim Betrachten von bestimmten blinkenden Lichtfolgen oder Mustern, die alltaeglich sind, kommen. Auch bei Personen, die niemals derartige Symptome an sich beobachtet haben, kann es beim Betrachten gewisser Fernsehbilder, beim Spiel an bestimmten Geraeten oder dem Beobachten bestimmter blinkender Lichtfolgen zu Stoerungen kommen. Sollten Sie beim Spielen Symptome wie Schwindelgefühl, verändertes Sehvermögen, Augen- oder Muskelzucken, Bewegungs- oder Orientierungsstoerungen feststellen so beenden Sie sofort das Spiel und konsultieren einen Arzt.

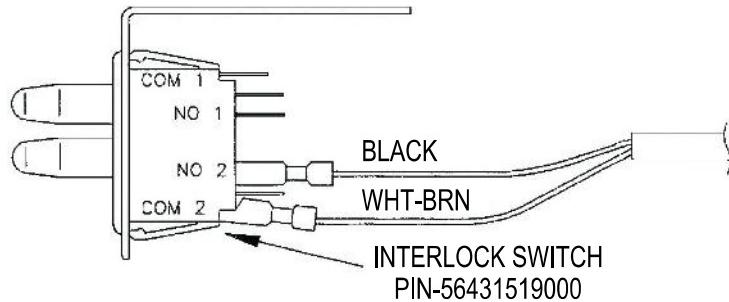
## **AVVISO IMPORTANTE!**

Un'esigua parte della popolazione puo' essere soggetta ad attacchi di epilessia o momentaneo perdite di coscienza quando guarda alcuni particolari tipi di scritte luminose lampeggianti comunemente presenti nell'ambiente in cui viviamo. Queste persone, che tuttavia possono non aver mai sperimentato simili sintomi, possono essere colpite da attacchi epilettici quando guardano certi tipi di immagini televisive oppure giocando con alcuni particolari videogiochi oppure guardando particolari scritte luminose lampeggianti. Si raccomanda quindi di controllare i ragazzi mentre giocano con questo flipper. Se si dovessero provare sensazioni come alterazione della vista, vertigini, contrazioni muscolari o degli occhi, movimenti involontari, **INTERROMPETE IL GIOCO IMMEDIATAMENTE** e consultate il vostro medico.

# IMPORTANT NOTICE

## PLEASE READ

This pinball game is equipped with a SAFETY FEATURE to prevent shocks from the solenoid circuit when the coin door is opened. An interlock switch, located at the left of the coin door opening, has been added to the game. When the coin door is opened, this interlock switch opens, breaking the connection to the +50V winding of the transformer secondary.



## Safety Notices

The following safety instructions apply to all game operators. We recommend that you read this page before setting up Attack From Mars. Use the following safety guidelines to help protect the system from potential damage and to ensure your personal safety.

- Attack From Mars will function at either 115V or 230V. Instructions on changing operating voltage can be found on Page 1-6.
- If operating at 230V, the operator must use a CE certified power cord rated for 250V, 5A.
- To help prevent electric shock, plug the system power cables into properly grounded power sources. These cables are equipped with 3-prong plugs to help ensure proper grounding.

Do not use adapter plugs or remove the grounding prong from a cable. If you must use an extension cable, use a 3-wire cable with properly grounded plugs.

- Do not spill food or liquid on your system.
- Do not push any objects into the openings of the system. Doing so can cause fire or electric shock by shorting out interior components.
- Keep your game far away from radiators and heat sources.
- Do not block cooling vents.
- Before working on the machine be sure to unplug it.
- Be sure to use fuses that meet the specified rating. Using fuses exceeding the specified rating can cause a fire and electrical shock.
- If the supply cord is damaged, it must be replaced by a special cord or assembly available from the manufacturer or service agent.
- CAUTION, battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.
- CAUTION, when you raise the backbox, it must be secured in place with the wing bolts provided. These can be found in the cash box. Do not rely on the latch alone. Instructions for lowering the speaker panel to access the mounting holes can be found on page 1-3.

## FCC Compliance

**Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

# **ATTACK FROM MARS™**

Information current at time of release.

Fill out and mail in warranty registration card. Be sure to include the game serial number. For your records, write the game serial number in the manual.

We reserve the rights to make modifications and improvements to its products.

The specifications and parts identified in this manual are subject to change without notice.

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# **ATTACK FROM MARS™**

## **Game Rules and Shotmaps**

# **ATTACK FROM MARS™**

## **GAME RULES**

**SUPER SKILL SHOT:** Hold left flipper button WHILE launching ball. Make any flashing arrow shot to collect.

**ATTACK WAVE:** Complete center 3-bank to start an Attack Wave. Save cities by shooting center shot to destroy the saucer. Save all 5 cities to Attack & Conquer Mars!

**EXTRA BALL:** Complete Attack Waves OR bottom lanes to light Extra Ball. Shoot right eject to collect.

**MULTI-BALL™:** Center loop lights lock. Lock 3 balls in center loop to start 3-ball multi-ball. Shoot ramps and loops to collect jackpots. Collect all 5 jackpots to light moving Super Jackpot.

**MARTIAN ATTACK:** Complete M-A-R-T-I-A-N targets to light Martian Attack at right eject. Shoot right eject to start. Hit all 4 Martians in the time allowed to start Martian Attack 2-ball Multi-ball.

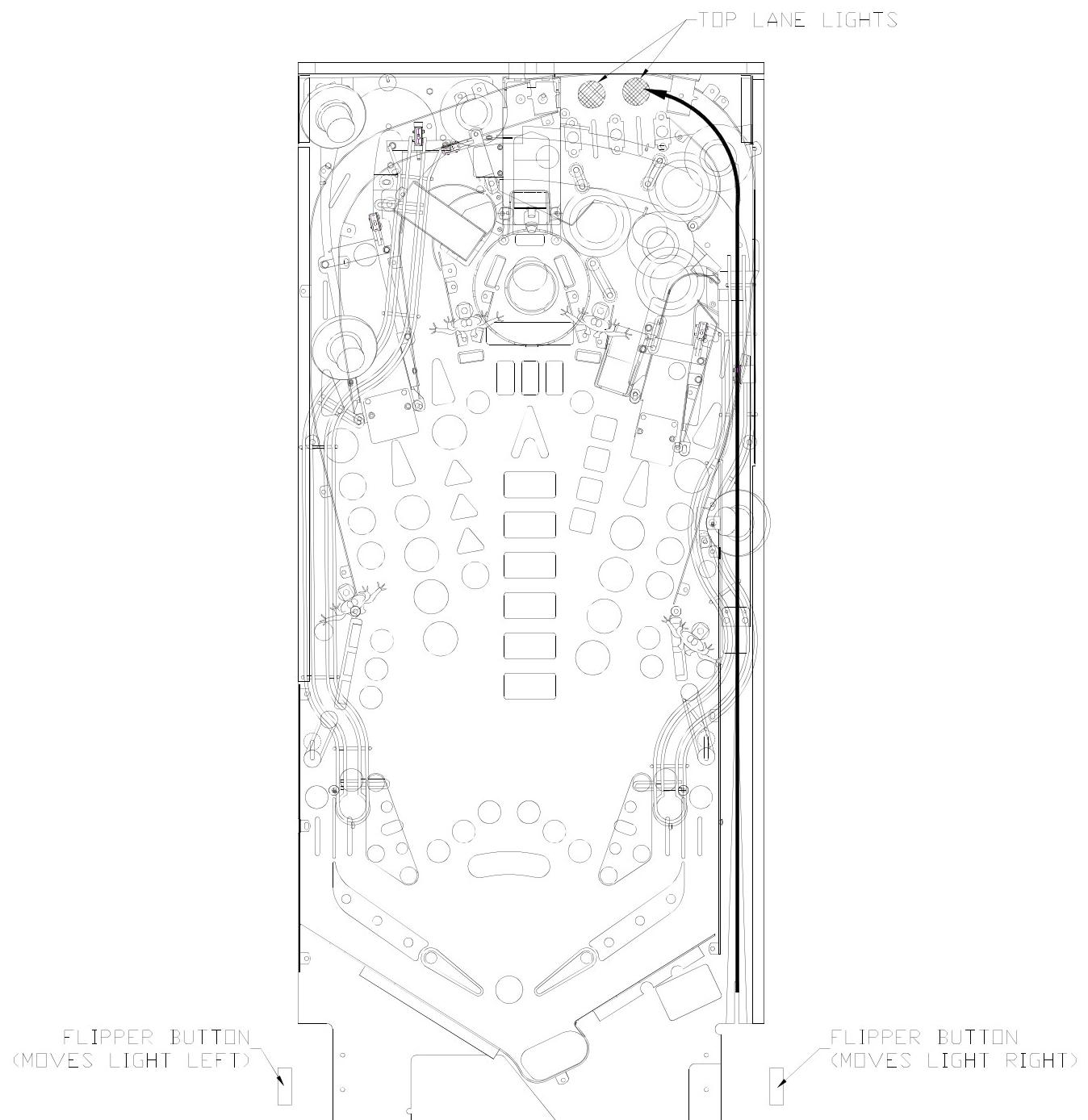
**TOTAL ANNIHILATION:** Complete Capture, Big-O-Beam, Tractor Beam or Atomic Blaster to start HURRY UP. Center shot awards HURRY-UP. Complete all 4 shots to start Total Annihilation 4-ball Multi-ball. Shoot ramps and loops while in Multi-ball to collect big points.

**COMBOS:** Make consecutive ramp and loop shots while red arrows are lit for Combos.

**SUPER JETS:** Get the number of jet hits needed (see display) to start Super Jets for big points.

**RULE THE UNIVERSE:** Collect Super jackpot, Super Jets, Martian Attack Multi-ball, Total Annihilation, Conquer Mars and 5-way combo to light Rule the Universe. Shoot right eject to start. Collect displayed points while in Multi-ball to Rule the Universe.

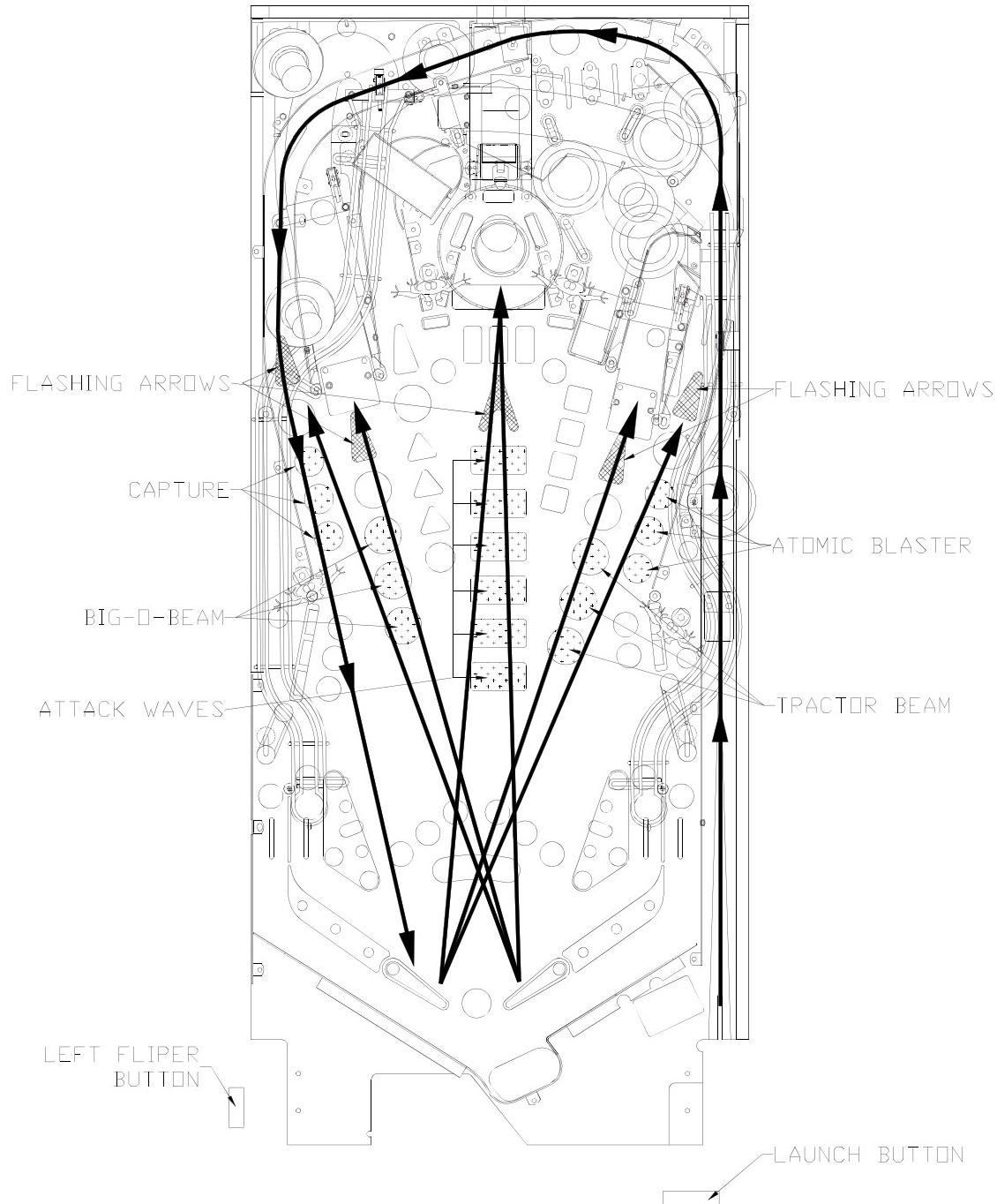
**SKILL SHOT** Collect Skill Shot at ball start by using flippers to move the blinking light on the top lanes to the same lane the ball rolls down. The right flipper button will move the light to the right; the left flipper button will move the light to the left. Skill Shot awards BIG POINTS and Plus 5X Bonus.



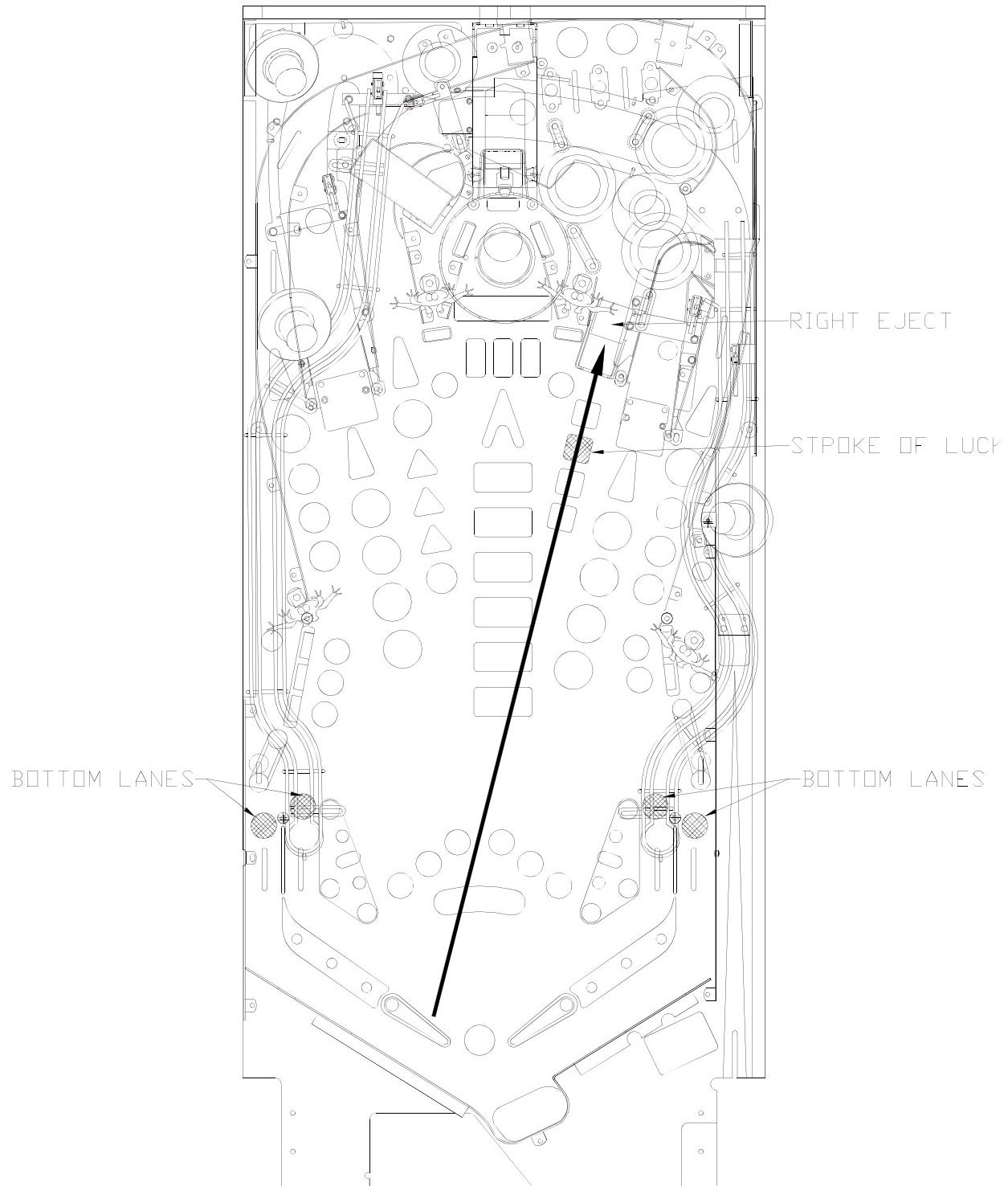
**SUPER SKILL SHOT** At ball start, hold left flipper button WHILE launching ball, then make any flashing arrow shot.

Making a ramp or loop shot will complete all 3 lights (Capture, Big-O-Beam, Atomic Blaster or Tractor Beam) in front of that shot.

Hitting the Center 3-Bank will start an Attack Wave.



**STROKE OF LUCK** Complete bottom lanes to light Stroke of Luck, at right eject. Shoot right eject to collect the Stroke of Luck mystery award (shown in display).

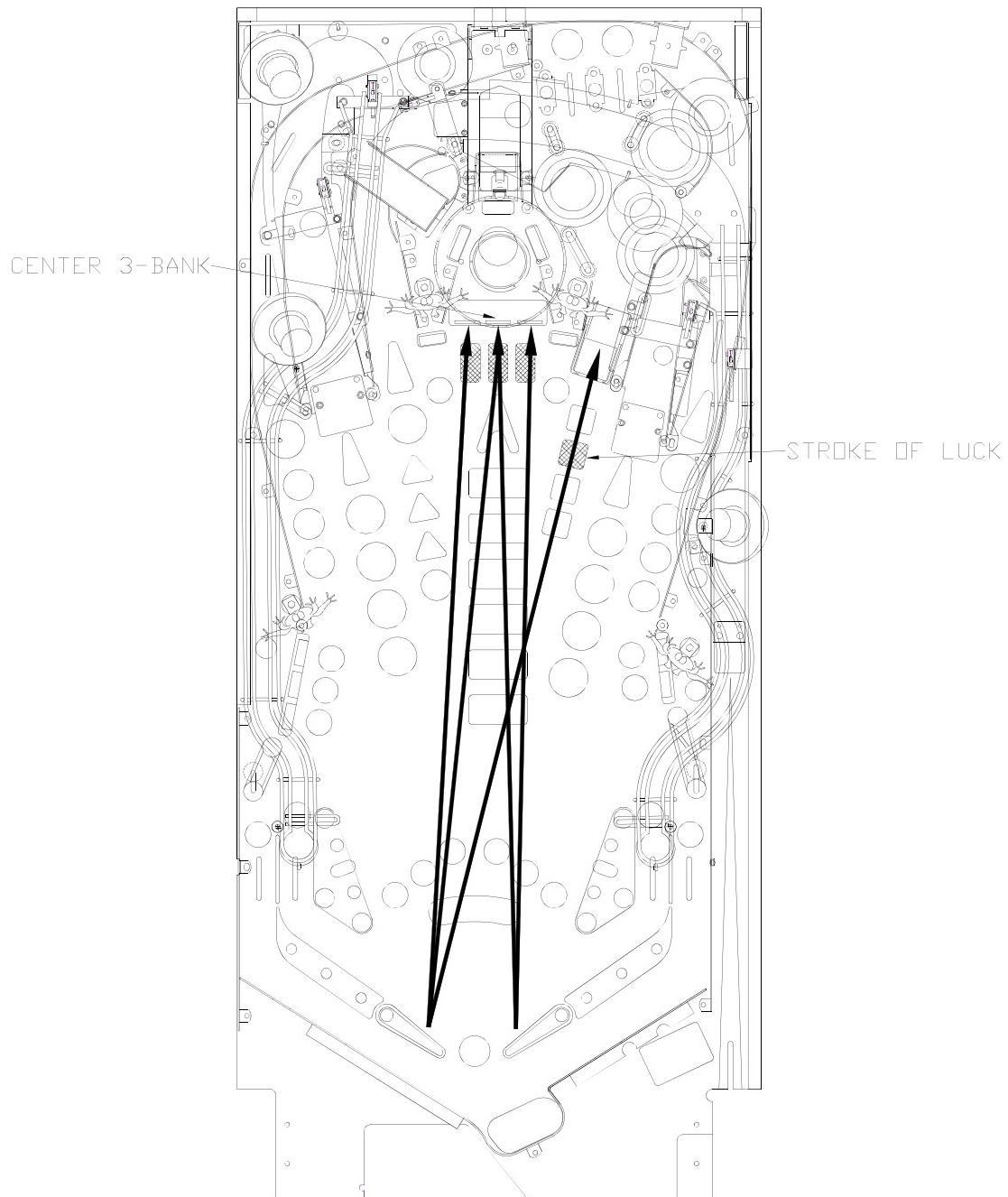


**STROBE MULTI-BALL** A 3-ball multi-ball, awarded by the Stroke of Luck mystery award feature.

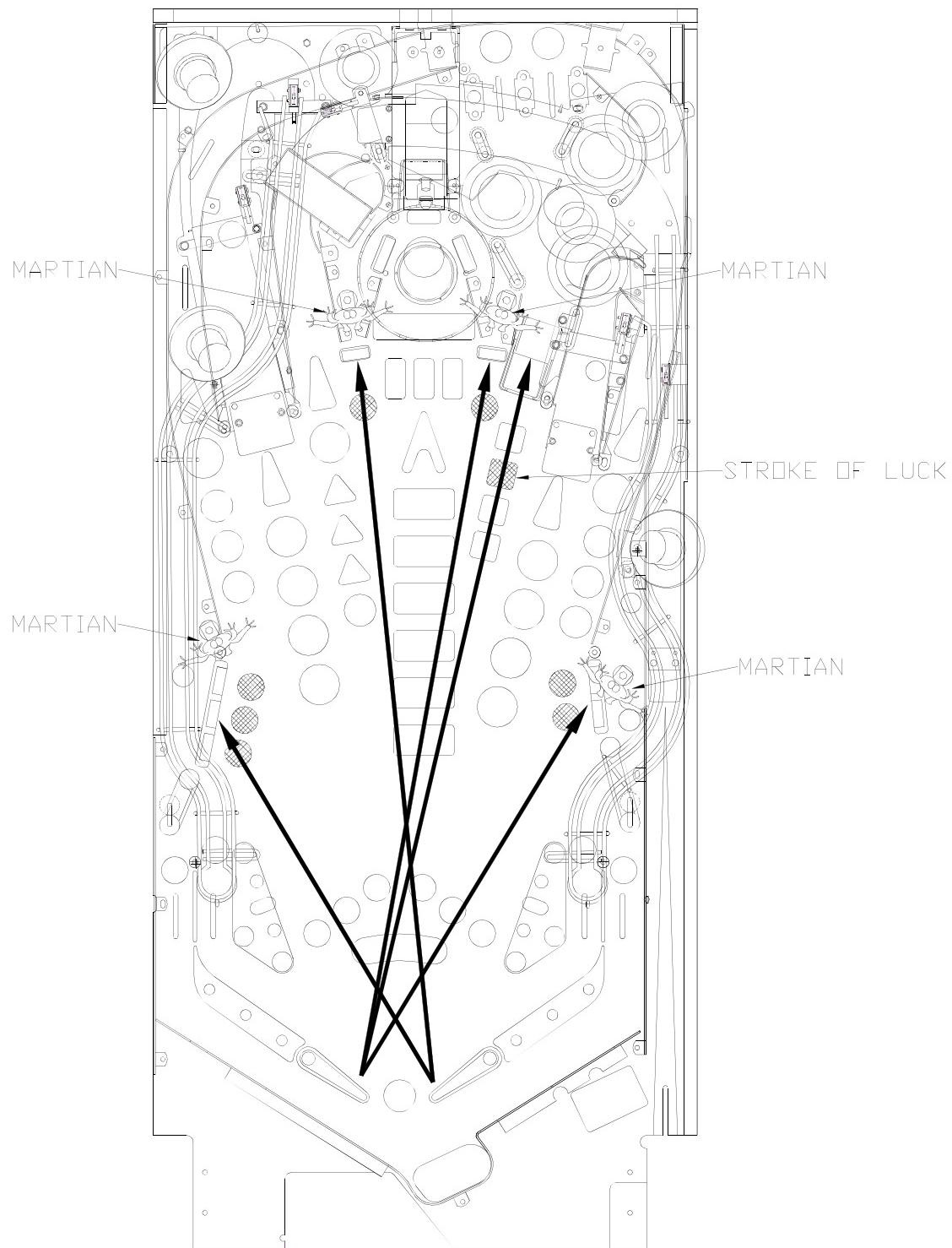
Hit center 3-bank while in multi-ball for BIG POINTS.

Hit center 3-bank, the displayed number of times, to light Extra Ball or collect Strobe Jackpot.

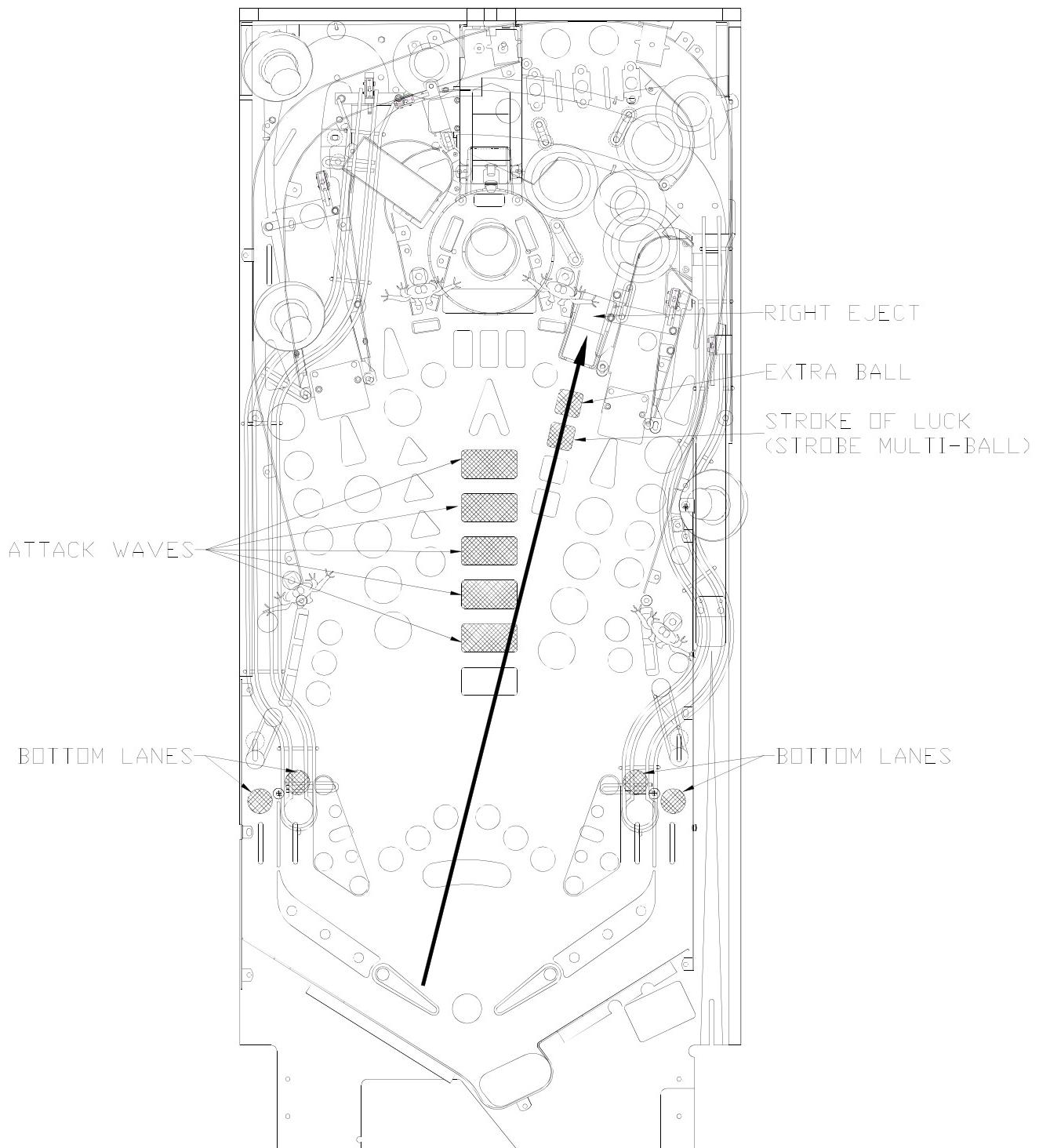
**Note:** During Strobe Multi-ball, the playfield is only lit up by the flashing strobe light.



**SNEAK ATTACK** Awarded by Stroke of Luck mystery award feature, this will start a Hurry-Up on one of the Martians. Hit the jumping Martian in the time allowed to score BIG POINTS.

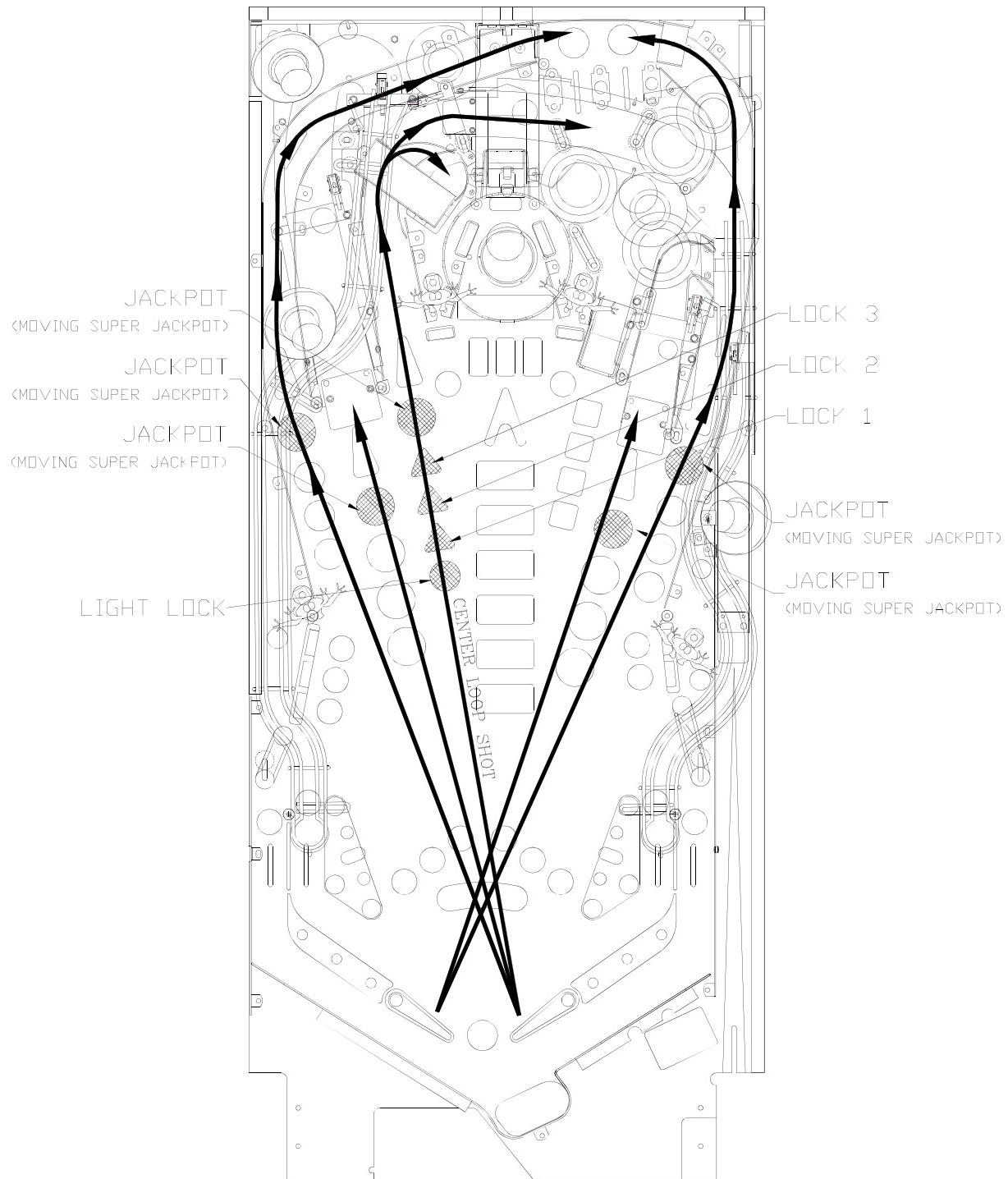


**EXTRA BALL** To light Extra ball, complete Attack Waves, or light all 4 bottom rollover lanes either the displayed number of times or during Strobe Multi-ball. Shoot right eject to collect Extra ball.



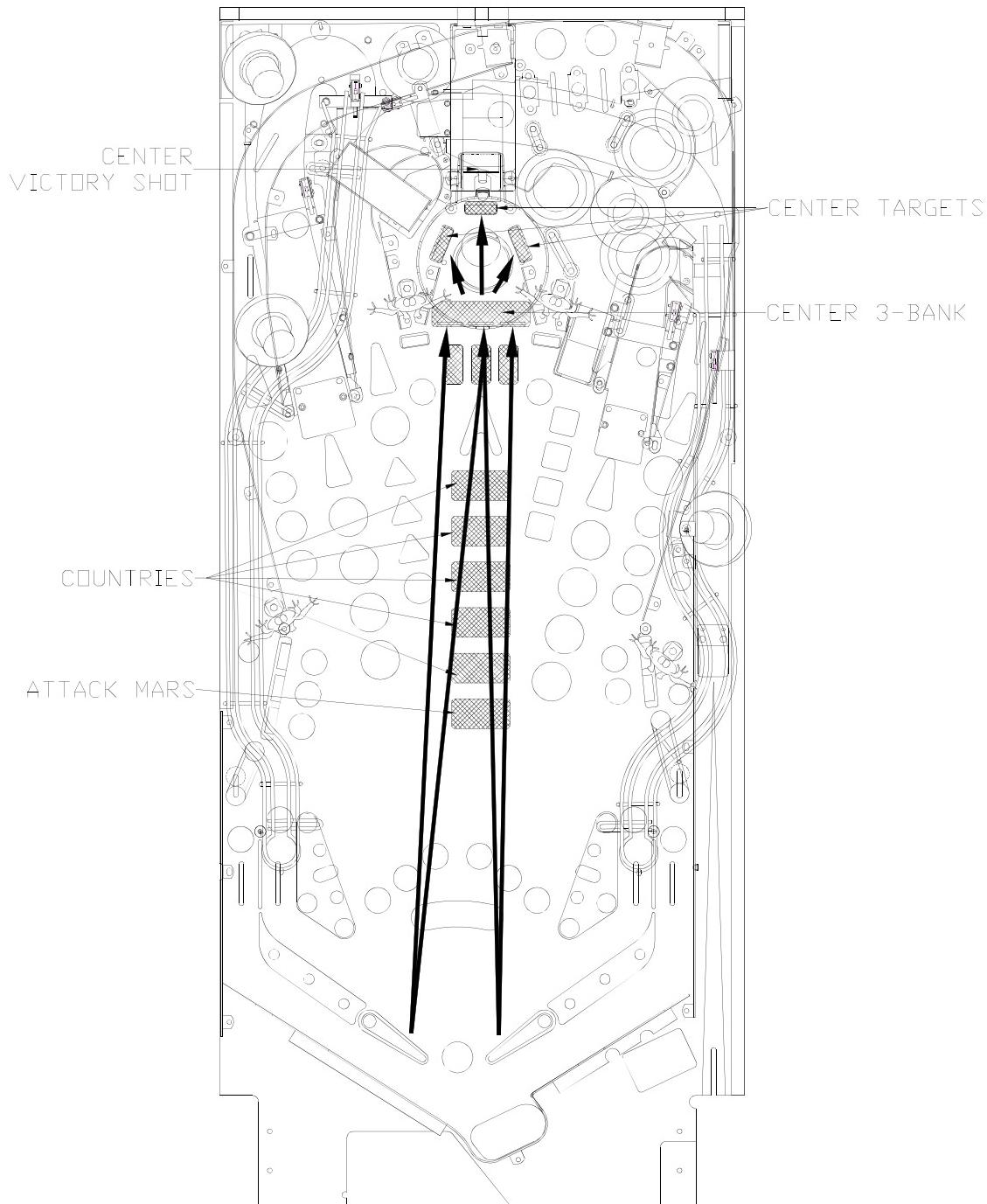
**MULTI-BALL™** Make center loop to light Locks, then shoot center loop to lock ball when lit. Lock 3 balls to start Multi-ball. Make ramp and loop shots to collect Jackpots.

Collect all 5 Jackpots to light moving Super Jackpot. Shoot moving jackpot light to collect Super Jackpot.

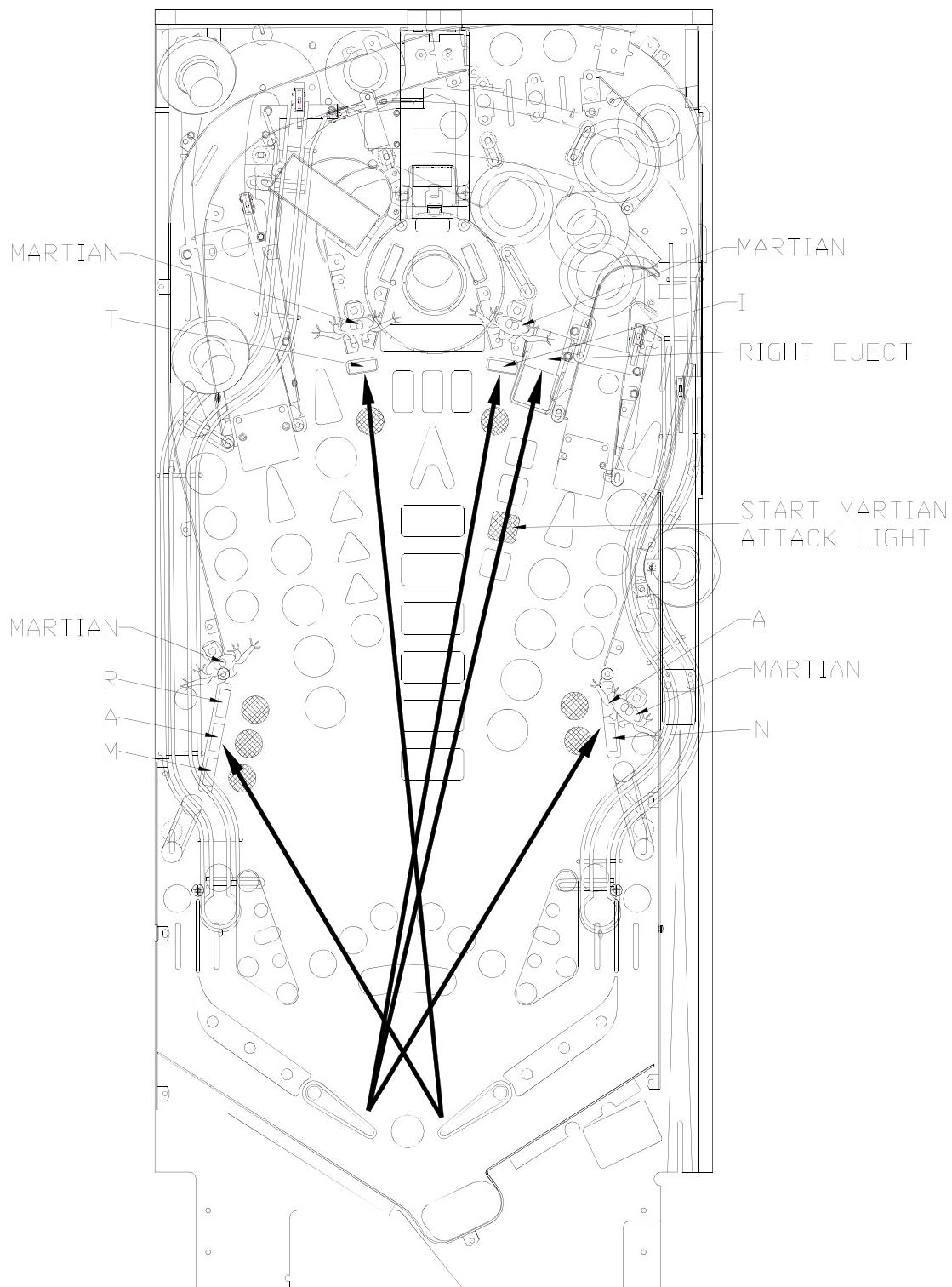


**ATTACK WAVES** Complete center 3-bank to start an Attack Wave. Save countries by shooting the center targets, then make center Victory Shot to destroy the attacking saucer.

Save all 5 countries to Attack Mars! When attacking Mars, shoot the center Victory Shot 10 times to Conquer Mars!

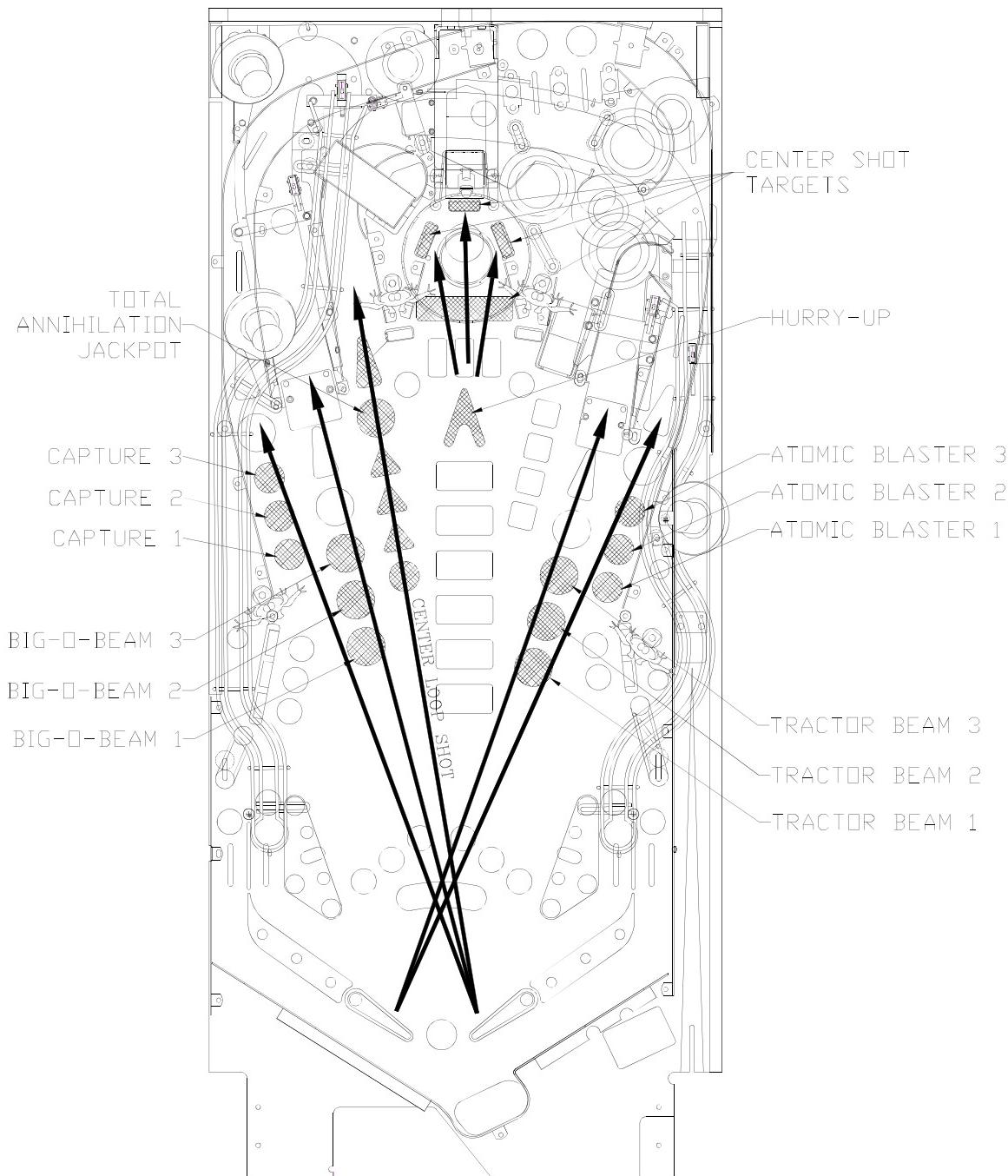


**MARTIAN ATTACK** Complete M-A-R-T-I-A-N targets to light Martian Attack at right eject. Shoot right eject to start Martian Attack. Hit all four Martians (targets) to start Martian Attack 2-ball Multi-ball. Hit as many Martians as you can during Multi-ball to score BIG POINTS.

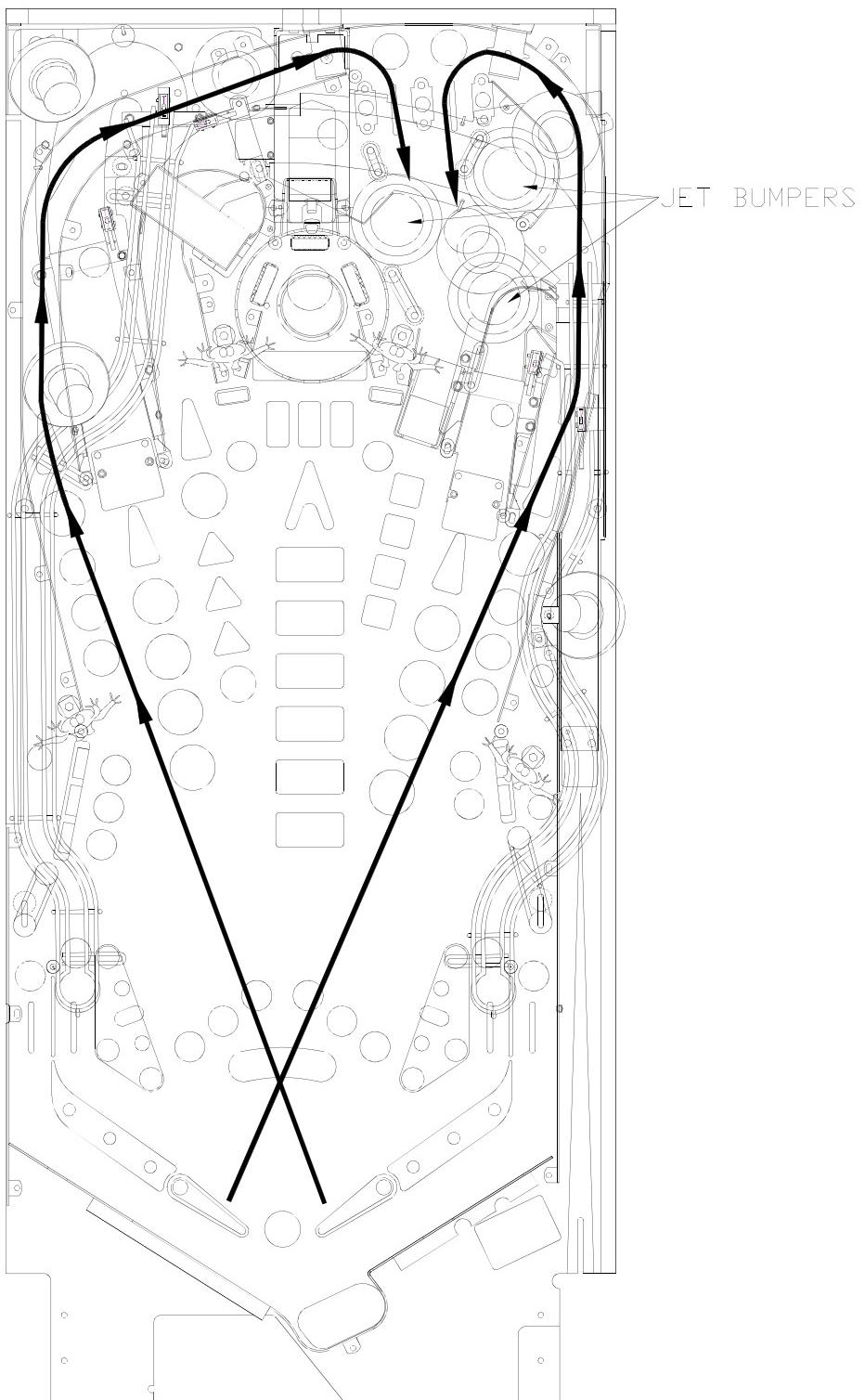


**HURRY-UP** Complete Capture, Big-O-Beam, Tractor Beam or Atomic Blaster to start Hurry-Up. Shoot any center shot to award Hurry-Up.

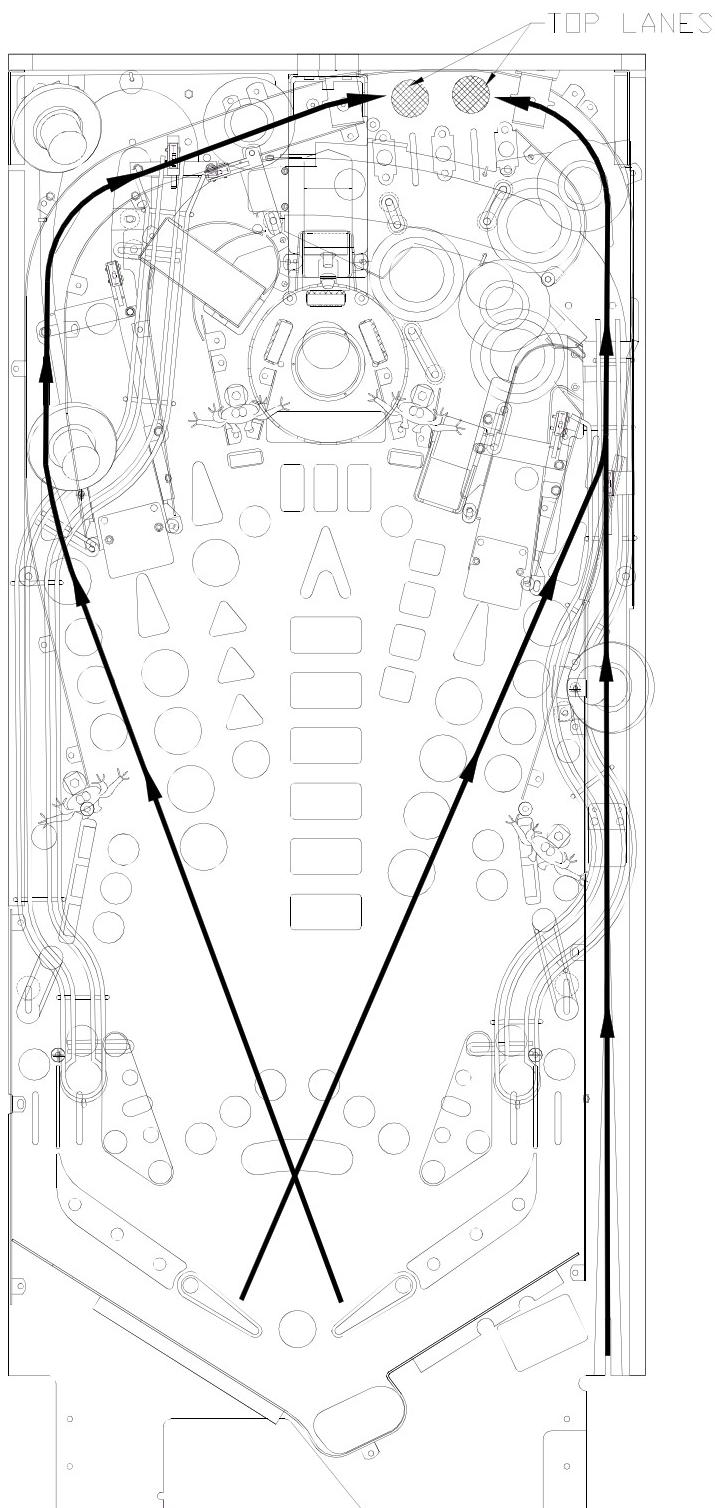
**TOTAL ANNIHILATION** Complete all 4 shots (Capture, Big-O-Beam, Tractor Beam AND Atomic Blaster) to start Total Annihilation 4-Ball Multi-ball. Shoot ramps and loops while in Multi-ball for BIG POINTS. Shoot center loop after making any other ramp or loop shot to collect Total Annihilation Jackpot.



**SUPER JETS** Get the number of jet bumper hits needed (see display) to start Super Jets. Shoot jet bumpers until the end of ball for BIG POINTS.

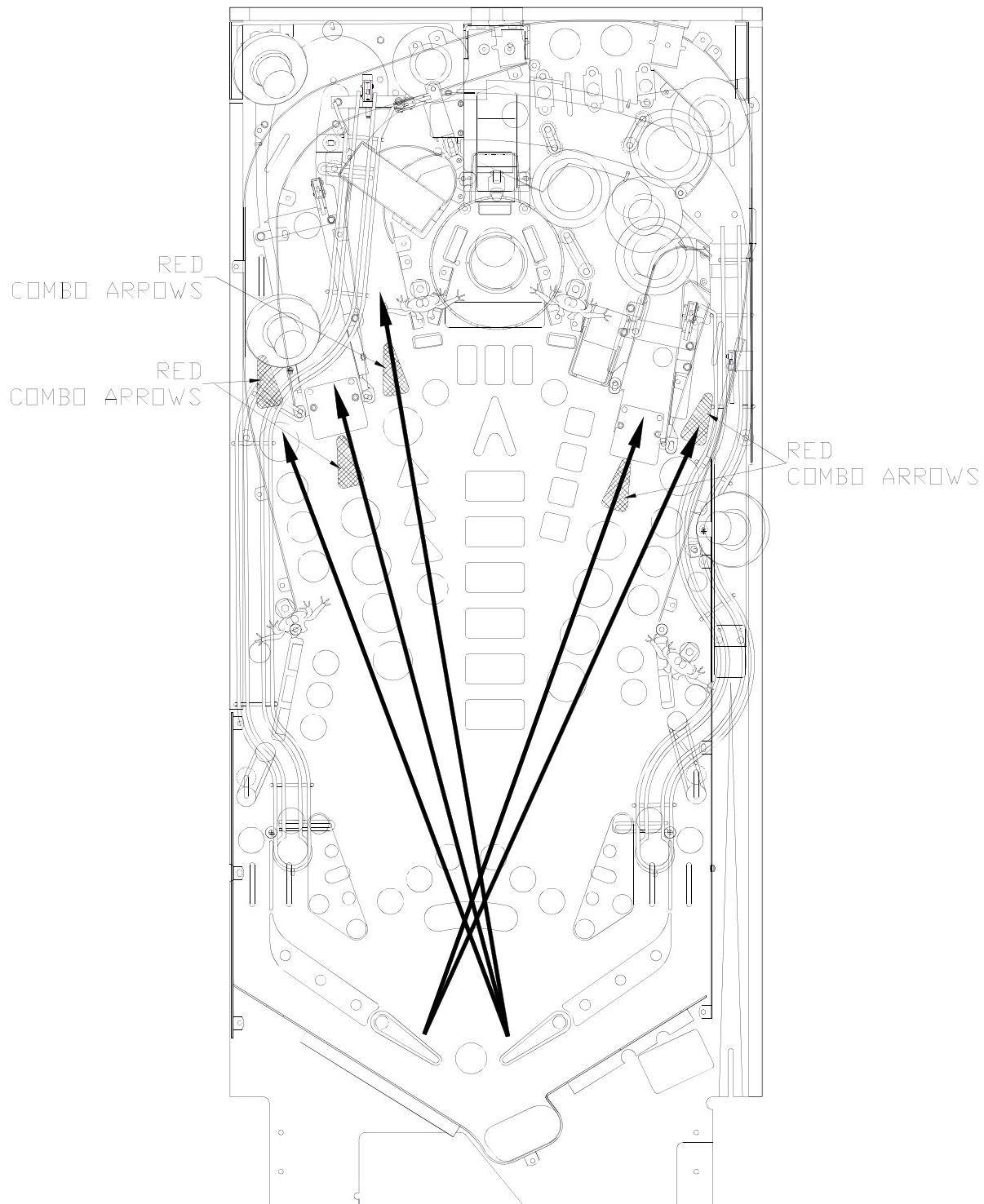


**BONUS X** Complete top lanes to award End-Of-Ball Bonus Multiplier. This also increases the value of the jets bumpers.



**COMBOS**

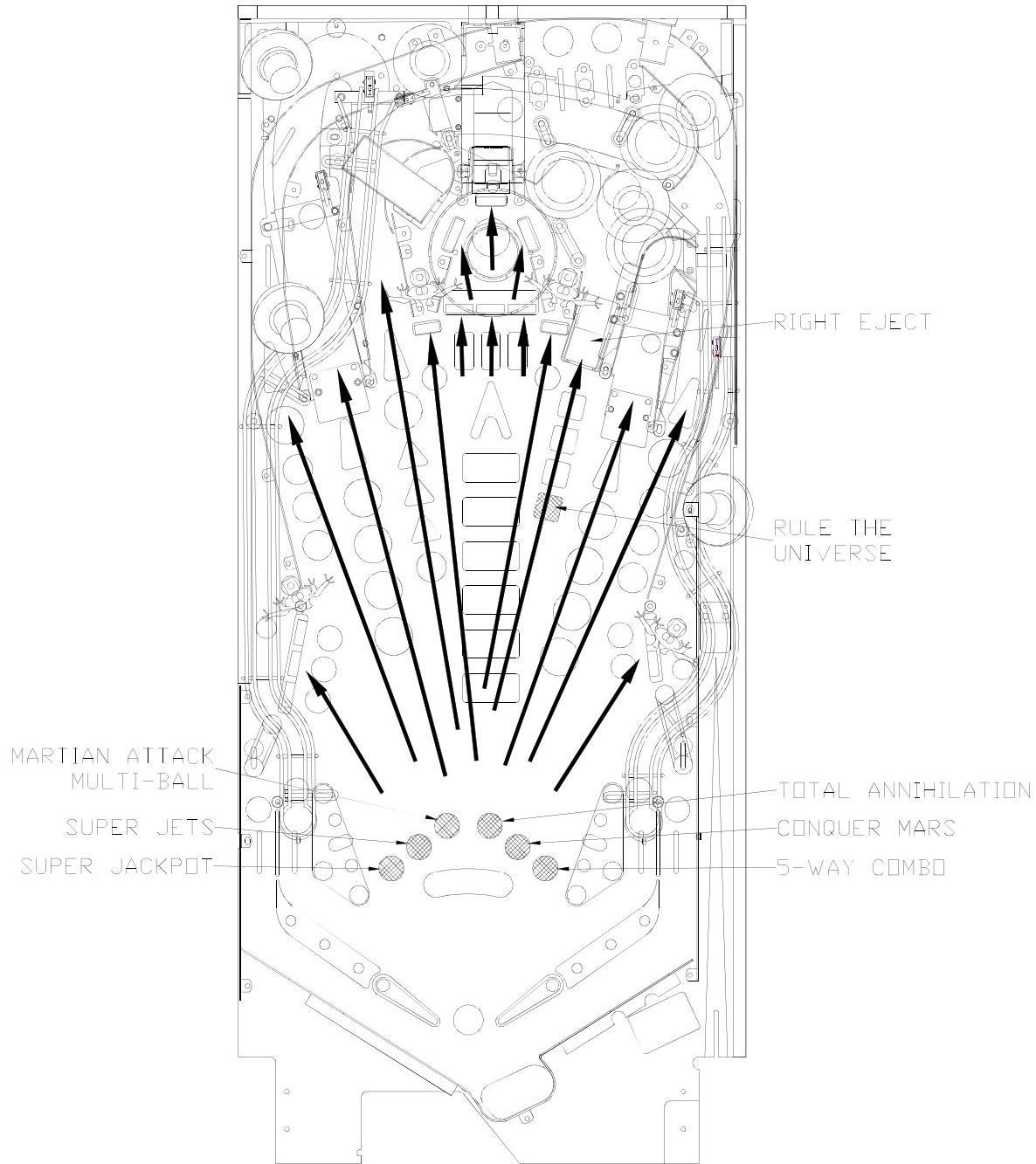
Make consecutive ramp and loop shots while Red Arrows are lit for Combo Awards.



**RULE THE UNIVERSE** Light Rule the Universe at right eject by:

- Collecting a Super Jackpot in 3-Ball Multi-ball,
- Starting Super Jets,
- Starting Martian Attack Multi-ball,
- Starting Total Annihilation,
- Completing all 5 Attack Waves and Conquering Mars,
- AND Making a 5-Way Combo.

Shoot right eject to start Rule the Universe. Make all shots to collect the displayed number of points, while in Multi-ball, to RULE THE UNIVERSE!



## NOTES

## NOTES

# **SECTION ONE**

## **GAME OPERATION AND TEST INFORMATION**

# PINBALL GAME ASSEMBLY INSTRUCTIONS

## ATTACK FROM MARS IS A FOUR BALL GAME.

Power: Domestic 115V @ 60Hz  
Foreign 230V @ 50Hz

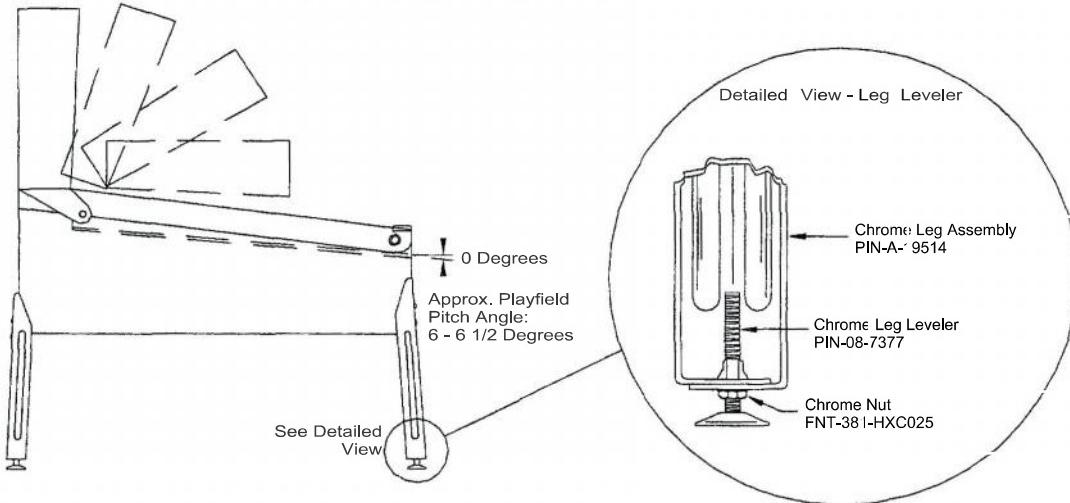
Dimensions: Width: 29" approx.  
Depth: 55" approx.  
Height: 78" approx.

Temp: 32°F to 100° F, (0°C to 38°C)  
Humidity: Not to exceed 95% relative.

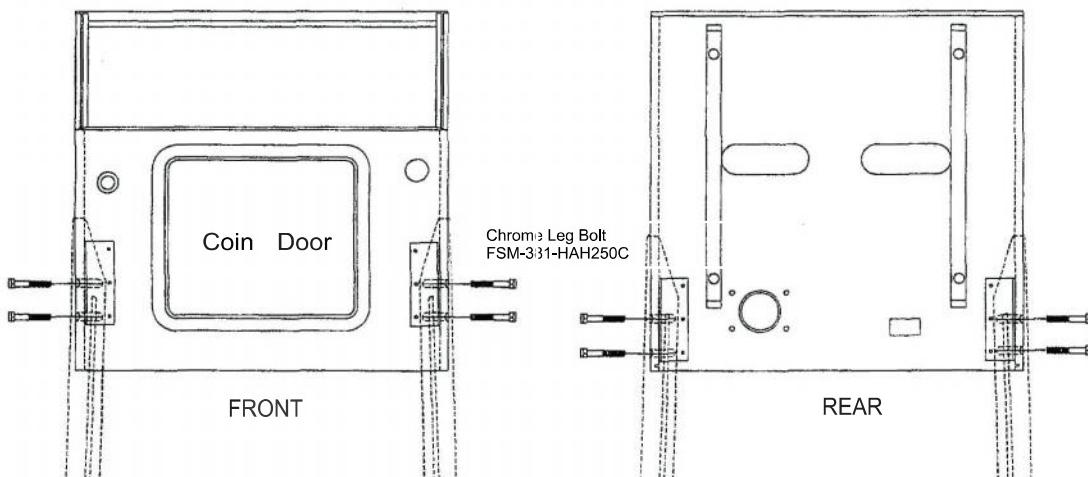
Weight: 325 lb. approx. (crated)

### **NOTE: FOR TOPPER INSTALLATION INSTRUCTIONS, SEE PAGE 2-29**

1. Remove all cartons, parts, and other items from the shipping container and set them aside.
2. Leg levelers come installed in the legs, and the leg bolts are installed in the leg mounting brackets. Remove the leg bolts from the cabinet. Place the cabinet on a support and attach rear legs using leg bolts (View 2).
3. Attach front legs using leg bolts (View 2).



**VIEW 1**



**VIEW 2**

Alternate Finish Part Numbers
STAINLESS FRONT MOLDING PIN-D-12615SS
STAINLESS SIDE MOLDING PIN-01-89932
STAINLESS LEG ASSEMBLY PIN-A-19514GN
GREEN FRONT MOLDING PIN-D-12615GN
GREEN SIDE MOLDING PIN-01-89932GN
GREEN LEG ASSEMBLY PIN-A-19514GN
BLACK FRONT MOLDING PIN-D-12615BK
BLACK SIDE MOLDING PIN-01-89932BK
BLACK LEG ASSEMBLY PIN-A-19514BK

4. Reach into the cabinet and backbox and ensure that the interconnecting cables are not kinked or pinched. Be careful to avoid damaging wires at any stage of the assembly process.
5. Raise the hinged backbox upright and latch it into position.

**Note:** The insert panel is no longer hinged to the backbox; it is attached to the backglass. The backglass and the insert panel are removed from the backbox housing as a single unit.

Unlock the backbox. Carefully, lift the backglass/insert panel from the bottom and slide it out of the backbox. Lay it down on the playfield glass. Unplug the insert panel cable from the controller PCB. Carefully, set the backglass/insert panel aside.

**Note:** The speaker panel uses a new hinging system. The bottom of the speaker panel remains attached to the backbox unit when released.

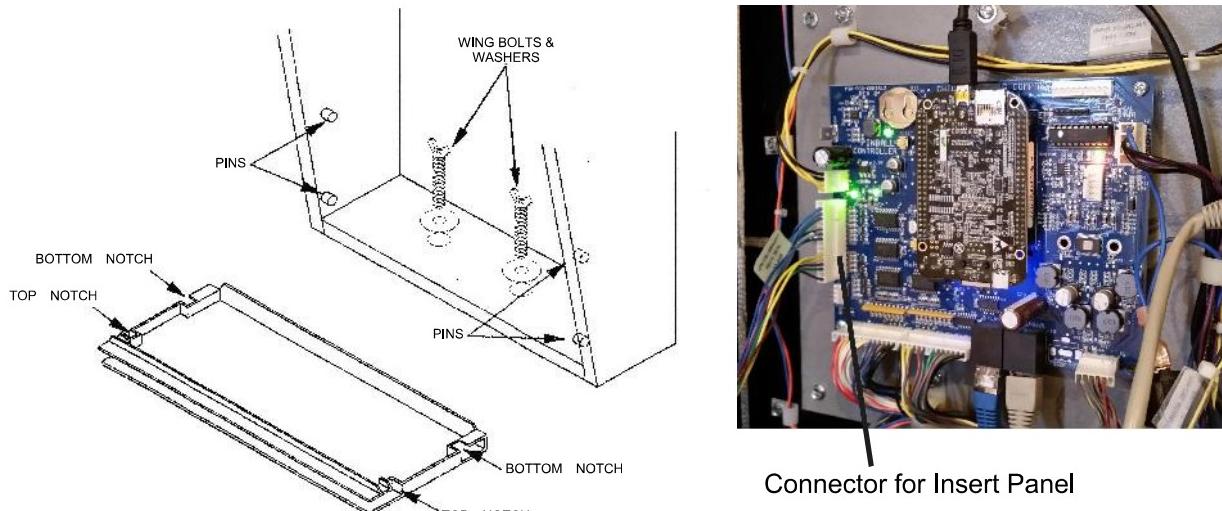
Carefully lift the speaker panel so that the top notches clear the top pins. Rotate it away from the backbox and toward the playfield glass. The bottom of the speaker panel remains attached to the backbox unit.

Lowering the speaker panel allows access to the holes for the bolts used to secure the backbox upright. Install one washer-head mounting bolt with washer a through each hole and into the threaded fasteners in the cabinet.

**Note:** You have the option of removing the speaker panel completely. Lay the speaker panel on the playfield glass.

**For Large Display:** Unplug the HDMI display cable, speaker cable, monitor power cable, and ground cable. Line up the bottom notches with the bottom backbox pins. Lower the speaker panel through the notches and slide it under the backbox pins.

**For Small Display:** Unplug the HDMI display cable, speaker cable, monitor power cable, and monitor keyboard cable. Line up the bottom notches with the bottom backbox pins. Lower the speaker panel through the notches and slide it under the backbox pins.

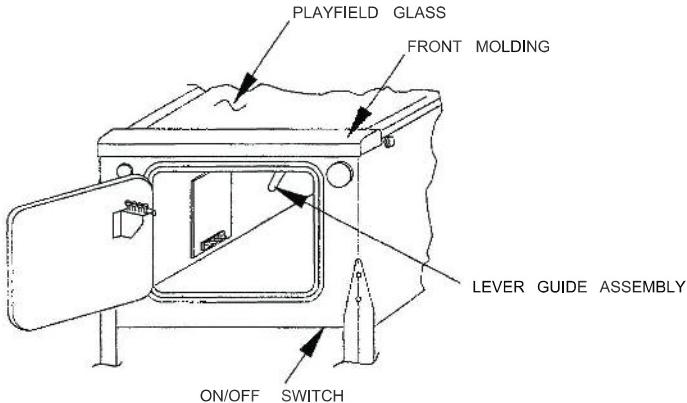


6. After the wing-head mounting bolts are installed, replace the speaker panel and the backglass/insert panel. Lock the backbox.

## CAUTION

**FAILURE TO INSTALL** the backbox mounting hardware properly can cause personal injury. **NEVER TRANSPORT** a pinball game with the hinged backbox erect. Always lower the backbox forward onto the playfield cabinet on a layer of protective material to prevent marring or damage and possible personal injury.

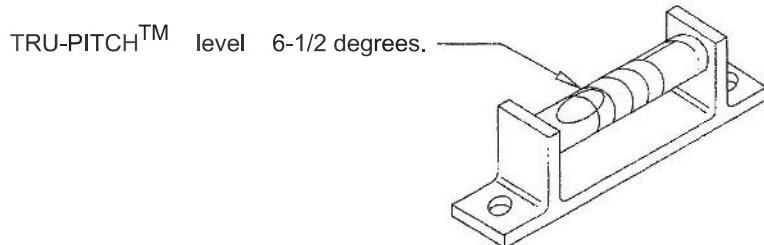
7. Extend each leg leveler *slightly* below the leg bottom, so that all four foot pads are extended about the same distance. Remove the cabinet from its support and place it on the floor.
8. Unlock and open the coin door. Move the lever guide toward the left side of the game, and lift the front molding off of the playfield cover glass. Slide the lever guide to the right, and close the coin door. Carefully slide the glass downward, until it clears the grooves of the left and right side moldings. Lift the glass up and away from the game, storing it carefully to avoid breakage.



9. Place a level or an inclinometer on the playfield surface. Adjust the leg levelers for proper playfield level (side-to-side).

*Note: This measurement must be made ON the playfield, not the cabinet or the playfield cover glass. Tighten the nut on each leg leveler shaft to maintain this setting.*

10. The TRU-PITCH™ level is located on the right shooter rail. This allows the playfield pitch angle to be properly adjusted WITHOUT REMOVING THE GLASS. The first line (closest to the front of the game) on the level is approximately 6 degrees. Every line thereafter is approximately another 1/2 degree of pitch. The recommended pitch is 6-1/2 degrees. The NOSE of the bubble should be between the first and second line on the level (see diagram below).

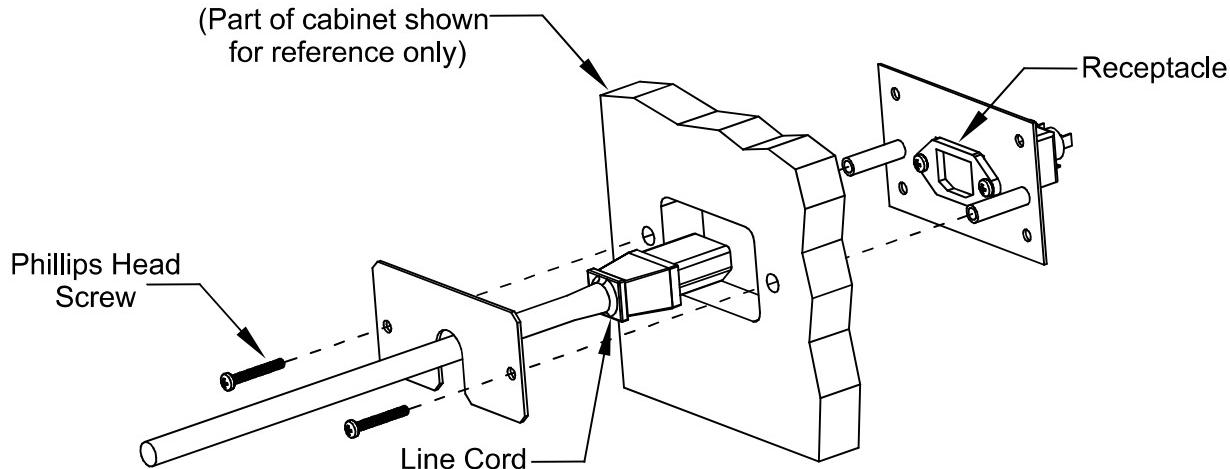


### IMPORTANT!

*Playfield pitch angle can affect the operation of the plumb bob tilt. The plumb bob weight is among the parts in the cash box; the operator should install the weight and adjust this tilt mechanism for proper operation, after completion of the desired playfield pitch angle setting. The unit is factory installed for a 6-1/2 degree angle. If an adjustment is necessary, loosen the screw at the bottom of the unit. Move the pointer, one groove at a time to the left or the right, depending on the degree desired. Hold the pointer in place and tighten screw*

11. Be sure the **required number** of balls is installed. The **ATTACK FROM MARS** game uses FOUR balls.

12. Clean and reinstall the playfield cover glass. Replace and lock the front molding.
13. To attach the line cord, retrieve the line cord cover and two black Phillips-head screws, to mount the cover, from the cash box. Match the prongs on the plug with the holes in the receptacle, and push the line cord securely into place. Make sure the cord is aligned with the indentation on the cabinet (indentation should point toward bottom of the cabinet). Slide the line cord cover plate over the line cord, and align the holes with the cabinet. Secure the plate with the two screws.

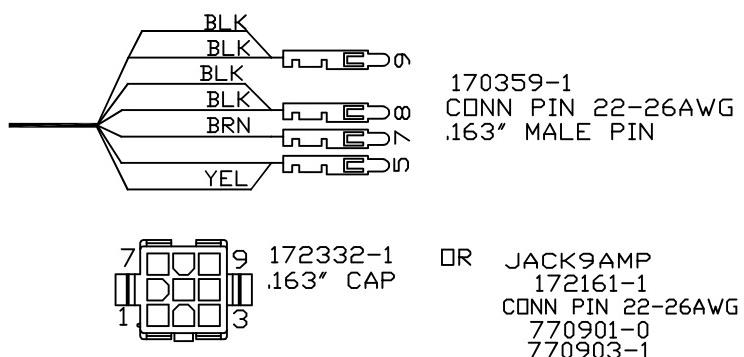


14. Move the game into the desired location; recheck the level and pitch angle of the playfield.
15. **IMPORTANT:** Fill out and return the warranty registration card.

## Bill Acceptor

Attack From Mars Remake was designed to use a 12V Bill Acceptor. We recommend using MEI AE2654U5E. This is an MEI 12VDC Upstacker Bill Acceptor 12VDC with 500 Cashbox.

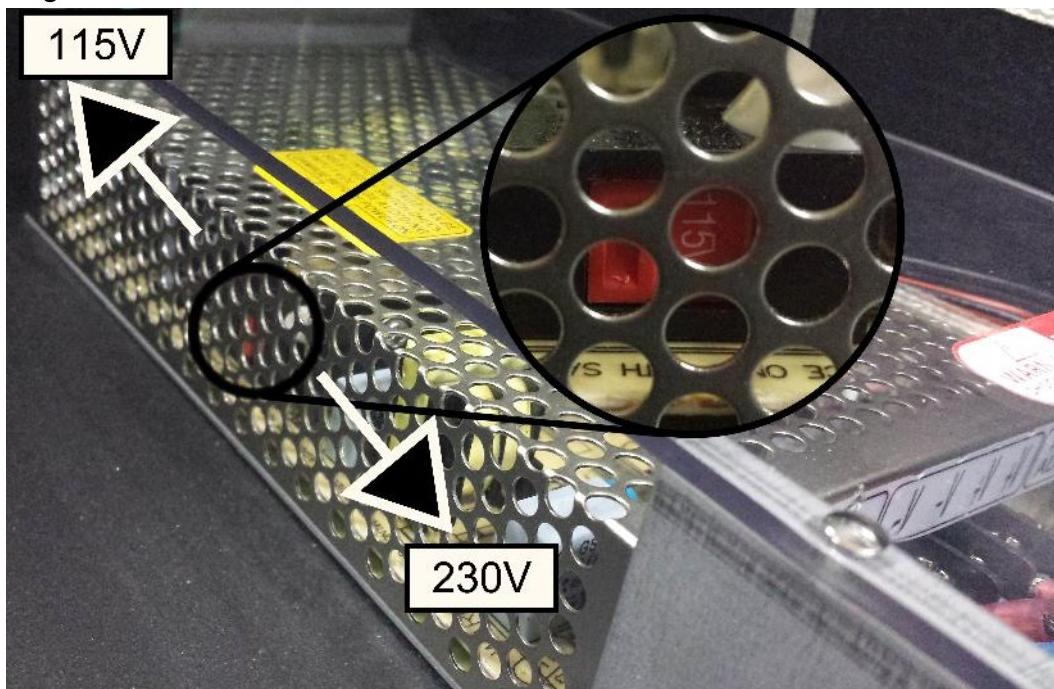
The connector for the bill acceptor can be found on the left side, inside the cabinet, near the plumb bob tilt mechanism.



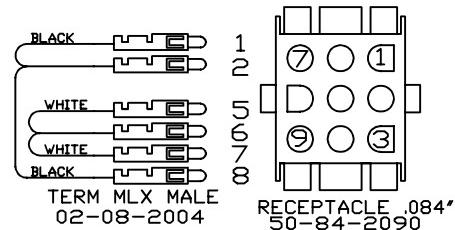
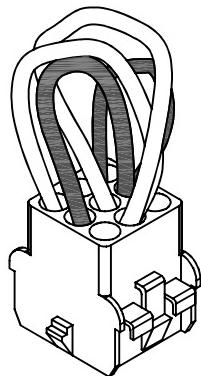
## VOLTAGE SELECTION

### ! CAUTION

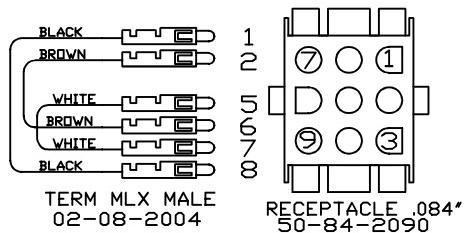
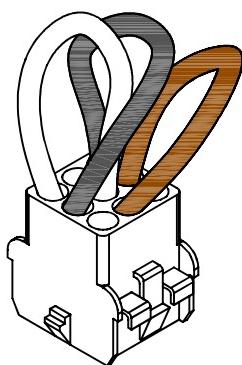
If you are converting a game between 115V and 230V, be sure to change the AC Input Selection switch on the power supply, and use the correct voltage selection block, shown below.



**115V Voltage Selection Block  
PIN-CBL-VOLT120**



**230V Voltage Selection Block  
PIN-CBL-VOLT240**



## GAME CONTROL LOCATIONS

### Cabinet Switches

The On-Off Switch is on the bottom of the cabinet near the right front leg. Press the side of the rocker switch closest to the front of the cabinet to power the game on.

The Start Button is a push-button to the left of the coin door on the cabinet exterior. Press the Start button to begin a game, or during the diagnostic mode, to ask for HELP.

### Coin Door Buttons

The operator controls all game adjustments, obtains bookkeeping information, and diagnoses problems, using only four push-button switches mounted on the inside of the coin door. The coin door buttons have two modes of operation Normal Function and Test Function.

#### Normal Function

The Service Credits button puts credits on the games that are not included in any of the game audits.

The Volume Up (+) button raises the sound level of the game. Press and hold the button until the desired level is reached.

The Volume Down (-) button lowers the sound level of the game. Press and hold the button until the desired level is reached. See Adjustment A.1 28 to turn sound off completely.

The Begin Test button starts the Menu System operation and changes the coin door buttons from Normal Function to Test Function.

#### Test Function

The Escape button allows you to get out of a menu selection or return to the Attract mode.

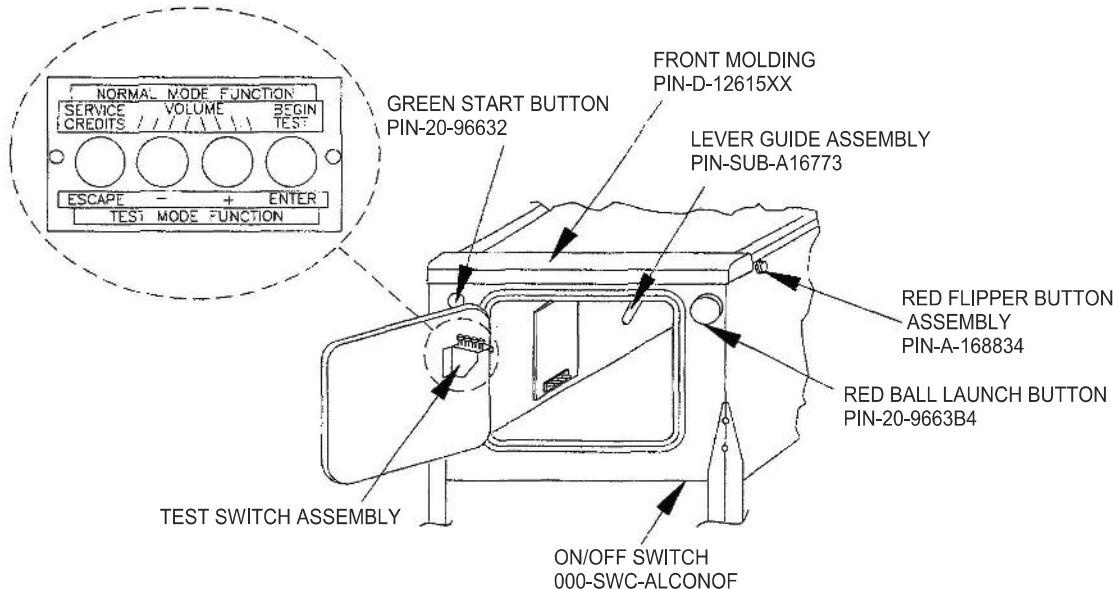
The Up (+) button allows you to cycle forward through the menu selections or adjustment choices.

The Down (-) button allows you to cycle backward through the menu selections or adjustment choices.

The \*Enter button allows you to get into a menu selection or lock in an adjustment choice.

Hold the Escape button for 4 seconds to enter the \*\*CGC SYSTEM MENU. See PAGE 1-10 for more information

#### COIN DOOR BUTTONS



Alternate Finish Part Numbers	
STAINLESS FRONT MOLDING	PIN-D-12615SS
STAINLESS SIDE MOLDING	PIN-01-89932
STAINLESS LEG ASSEMBLY	PIN-A-19514GN
GREEN FRONT MOLDING	PIN-D-12615GN
GREEN SIDE MOLDING	PIN-01-89932GN
GREEN LEG ASSEMBLY	PIN-A-19514GN
BLACK FRONT MOLDING	PIN-D-12615BK
BLACK SIDE MOLDING	PIN-01-89932BK
BLACK LEG ASSEMBLY	PIN-A-19514BK

\*To reset High Score, hold down the Begin Test/Enter switch for five seconds while in the Attract mode.

\*\* This menu did not exist in the original game

## GAME OPERATION

### CAUTION

After assembly and installation at its site location, this game must be plugged into a properly grounded outlet to prevent shock hazard, and to assure proper game operation. DO NOT use a 'cheater' plug to defeat the ground pin on the line cord. DO NOT cut off the ground pin.

**POWERING UP.** With the coin door closed, plug the game in, and switch it on. In normal operation, TESTING shows in the displays as the game performs Start-up tests. Once the Start-up tests have been successfully completed the last score is displayed and the game goes into the Attract mode.

**Note:** After the game has been on location for a time, the Start-up tests may contain messages concerning game problems. See 'Error Messages' for more detailed information regarding messages.

Open the coin door and press the Begin Test switch. The display shows the game name, number, and software revision. The message changes and the display will show the sound software revision, the revision level of the system software, and the date the software was revised.

<b>Example:</b>	<b>ATTACK FROM MARS</b>	<b>Sound Rev. 1.0</b>
	<b>50041</b>	<b>Sy. 3.55</b>
	<b>Rev. 1.0</b>	<b>01/22/96</b>

Press the Enter button to enter the Menu System (refer to the section entitled "Menu System Operation" for more information). Perform the entire Test menu routine to verify that the game is operating satisfactorily.

**In order to operate the tests that use the +50V circuit, pull the top interlock switch button out. The interlock switches are located on a bracket in the coin door opening.**

**ATTRACT MODE\***. After completing the Test menu routine, press the Escape button three times to enter the Attract mode. During the Attract mode, the display shows a series of messages informing the player of the recent highest \*scores, \*\*custom messages", and the score to obtain a replay \*award.

**CREDIT POSTING.** Insert coin(s). A sound is heard for each coin, and the display shows the number of credits purchased. So long as the number of maximum allowable credits\* are NOT exceeded by coin purchase or high score, credits are posted correctly.

**STARTING A GAME.** Press the Start button. A startup sound plays, and the credit amount shown in the display decreases by one. The display flashes 00 (until the first playfield switch is actuated), and shows ball 1. If credits are posted, additional players may enter the game by pressing the Start button once for each player, before the end of play on the first ball.

**TILTS.** Actuating the cabinet tilt switch inside the cabinet ends the current game and proceeds to the Game Over mode. With the third closure\* of the plumb bob tilt switch, the player loses the remaining play of that ball, but can complete the game.

**END OF A GAME.** All earned scores and bonuses are awarded. If a player's final score exceeds the specified value, the player receives a designated award for achieving the current highest score. A random digit set\* appears in the display. Credits\* may be awarded, when the last two digits of any player's score match the random digits. Match, high score, and game over sounds are made.

**GAME OVER MODE.** The Game Over display shows the high scores and the game proceeds to the Attract Mode.

\* - Operator-adjustable feature

## RAISING THE PLAYFIELD

### CAUTION

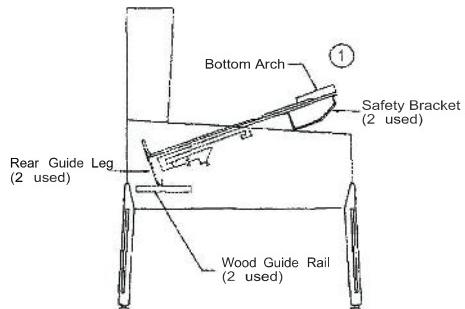
**Do not raise the playfield straight up! This game uses a slide assembly to raise and lower the playfield.**

#### Before Raising the Playfield:

**Be sure there are no balls present in the ball trough or any of the other ball-holding playfield devices (i.e. poppers). Raising the playfield with balls present in these locations may cause them to come loose and damage the playfield. Use the "Empty Balls Test" to remove all of the balls from these locations.**

#### To Raise the Playfield:

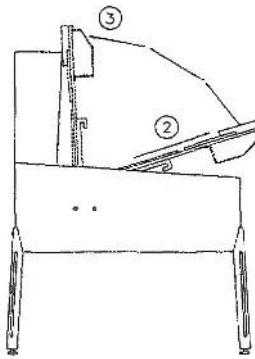
1. Grasp bottom arch and carefully lift up playfield only high enough to clear safety brackets. Rear guide legs should not hit wood guide rails, or be used to slide out playfield.



2. Pull the playfield out toward you until it stops (rest position), and raise it approximately 3".

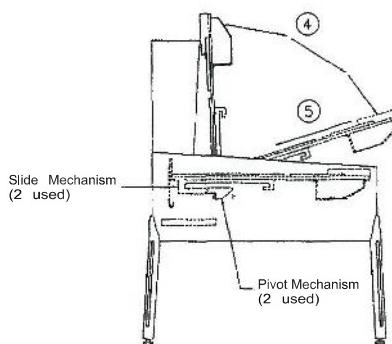
**Be sure playfield is in locked position and does not slide back into cabinet. If it does, repeat Step 2 before proceeding to Step 3.**

3. Rotate playfield to upright service position (lean on backbox) by pulling toward you and up. Listen for the sound of a click: this ensures locking and pivoting sequence.



#### To Lower the Playfield.

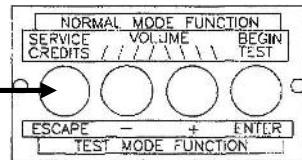
4. Rotate the playfield to the rest position. This unlocks the pivoting mechanism.
5. Push the playfield back into cabinet and into the playing position.



## CGC SYSTEM MENU OPERATION

The System Menu displays the current software versions and allows you to adjust dipswitch settings, as well as for features unique to AFMr. To access the System Menu, open the coin door and hold the Service Credits button for four seconds. Press Service Credits again to move through screens, and to exit the System Menu from the Dipswitch Settings screen.

Press and hold the **Service Credits** button  
for 4 seconds to enter the System Menu



PRESS SERVICE TO START CGC MENU

### INFORMATION

SOFTWARE VERSION:	1.0
BUILD DATE:	JUN 15 2017
PLAYFIELD FIRMWARE REV:	1.0
SPI STATUS:	GOOD
SUBWOOFER BAL. - USE L/R FLIP	0

### SUBWOOFER BALANCE

This setting changes the audio balance between subwoofer and speaker panel. Use the Left and Right Flipper Buttons to adjust the levels. Use the right button to increase the level of the speaker panel, and the left button to increase the level of the subwoofer.

## DISPLAY MENU

The first page of the system menu allows you to make adjustments to the game's display.

To change a setting, use **UP/DOWN** to highlight the setting, and press **ENTER** to select it. Press **UP/DOWN** to change the setting. When you are done, press **ENTER** again to save the new setting. Press **SERVICE** advance to the next page and exit the menu.



### DISPLAY COLOR

This setting changes the color of the dot matrix display in game. There are several preset color configurations, or you can set it to a custom color.

#### RED, GREEN, BLUE

**0 – 100, Default: GREEN**

Turning each of the three colors up or down allows you to set the display to any color you would like.

#### COLORIZE

**ON, OFF, NOT INSTALLED**

This setting turns the full colorized display on or off. ON will turn on the fully colorized version. OFF will be the monochromatic game using the DISPLAY COLOR that is set above. If you do not own the color upgrade, this option will be unavailable and marked NOT INSTALLED.

#### CUSTOM LOGO

Limited and Special Editions of Attack from Mars support custom logo display. This requires a microSD card, formatted in FAT32.

##### **Logo Requirements**

- **Image must be named userlogo.bmp**
- **Image must be 320 x 80 pixels**
- **Image must be 24-bit color, uncompressed. This is the normal Windows format for BMPs.**

##### **Custom Logo Instructions**

- 1) On your computer, make sure the logo you want to use matches the requirements listed on above.
- 2) Insert a microSD card in your computer. Check that the card is formatted as FAT32.
- 3) Drag and drop the logo onto the top level of he drive (not in a subdirectory). This file must be named userlogo.bmp.
- 4) Remove the card from your computer.
- 5) Remove the backbox insert from Attack from Mars.
- 6) With the game powered on, insert the microSD into the controller board. There is only one way the card can be inserted.
- 7) Hold the **SERVICE** button for 5 seconds to enter the CGC System Menu. Press **SERVICE** again to go to the Display Menu.
- 8) Press **START**.

## CUSTOM LOGO SETUP

PRESS LAUNCH TO LOAD LOGO FROM SD CARD



NO IMAGE  
LOADED

PRESS START TO RETURN TO MENU

- 9) Press **LAUNCH** to load your custom logo, or press **START** to return to the menu.

## CUSTOM LOGO SETUP

COMPLETE



USE FLIPPERS TO SELECT IMAGE  
PRESS START TO RETURN TO MENU

- 1) 10) After loading your logo, you will be able select between the Bally™ logo, or your new custom logo. Use the flippers to switch logos. You can also switch between logos at any time, without a microSD card, by coming back to this menu.

## CUSTOM LOGO SETUP

RETURNING TO MENU

PLEASE REMEMBER TO REMOVE SD CARD

GAME WILL NOT BOOT PROPERLY  
WITH SD CARD INSTALLED

IF YOU DO NOT REMOVE THE MICROSD CARD AFTER INSTALLING YOUR LOGO, ATTACK FROM MARS WILL NOT BOOT PROPERLY. REMOVE THE CARD AFTER INSTALLING THE LOGO.

## LIGHTING MENU

The second page of the System Menu allows you to adjust the brightness, color, and other settings for game lamps.

LIGHTING MENU – PRESS SERVICE TO ADVANCE	
INCANDESCENT EMULATION	SLOW
BACKBOX GI CONTROL	STOCK
BACKBOX BRIGHTNESS	MAX
PLAYFIELD GI	MAX
PLAYFIELD LED	MAX
MINI-Saucers	INTERACTIVE
SPEAKER LED	INTERACTIVE
BIG SAUCER	INTERACTIVE

### INCANDESCENT EMULATION

**OFF, SLOW, MED, FAST, DEFAULT: SLOW**

Attack from Mars replicates the look of incandescent lights while using LEDs. The incandescent emulation setting allows you to adjust the speed that the LEDs turn on and off.

### BACKBOX GI CONTROL

**STOCK, MIRROR PF GI, ALWAYS ON, DEFAULT: STOCK**

Attack from Mars allows you to control how the GI's in the backbox behave. Stock matches the original game: some GI boards in the backbox will adjust brightness according to game features. Mirror PF GI will blackout all backbox GIs when the playfield GIs turn off. Always On will keep all backbox GIs at full brightness.

### BACKBOX BRIGHTNESS

**-3, -2, -1, MAX, DEFAULT: MAX**

Attack from Mars allows you to adjust the brightness of the GI's in the backbox.

### PLAYFIELD GI

**MIN, -3, -2, -1, MAX, DEFAULT: MAX**

Attack from Mars allows you to adjust the brightness of the GI's on the playfield.

### PLAYFIELD LED

**MIN, -3, -2, -1, MAX, DEFAULT: MAX**

Attack from Mars allows you to adjust the brightness of the playfield lamps.

**NOTE:** *The following settings only apply to games with the Mini-Saucer LED Board, Tri-Color Saucer Board, and Speaker LEDs installed.*

### MINI-Saucers

**OFF, RED, GREEN, INTERACTIVE, DEFAULT: INTERACTIVE**

The RED or GREEN setting will cause the mini-saucers to constantly perform a chase pattern. When set to INTERACTIVE, each of the six mini-saucers can perform a different pattern in a different color during gameplay. The different patterns will be activated by events in game.

### **SPEAKER LED**

**OFF, RED, GREEN, BLUE, INTERACTIVE, DEFAULT: INTERACTIVE**

The RED, GREEN, or BLUE settings will force the speaker LEDs to stay on in that one color. When set to INTERACTIVE, the speaker LEDs will change colors and flash, triggered by events in the game.

### **BIG SAUCER (ONLY AVAILABLE ON GAMES WITH COLOR KIT UPGRADE INSTALLED)**

**OFF, RED, GREEN, BLUE, INTERACTIVE, DEFAULT: INTERACTIVE**

The RED, GREEN, or BLUE settings will cause the large saucer to only use that color. The pattern is the same as in the original game. When set to INTERACTIVE, the saucer will perform the patterns in a different color during gameplay. Classic Edition games without the color upgrade installed only support red LEDs for the big saucer, and this menu setting is unavailable.

## **COILS MENU**

The third page of the System Menu allows you to adjust the strength of the solenoids in the game.

COILS MENU – PRESS SERVICE TO ADVANCE	
FLIPPER STRENGTH	DEFAULT
TROUGH POP STRENGTH	DEFAULT
JET STRENGTH	DEFAULT
SLING STRENGTH	DEFAULT
AUTO PLUNGER STRENGTH	DEFAULT
SHAKER STRENGTH	DEFAULT
SHAKER TEST – HOLD LAUNCH	OFF

### **FLIPPER STRENGTH**

The strength of the flipper coils is highly adjustable. This adjustment is very useful for making Attack from Mars feel just like you remember. The DEFAULT setting should feel great at most locations. However, if the line voltage into the game is too high or too low, this setting allows you to tweak the strength of the flippers so it feels just right.

### **TROUGH POPPER STRENGTH**

**MIN, DEFAULT, +1, MAX**

This adjustment changes the strength of the Trough Popper. If the ball is being kicked out of the trough too hard, try turning the strength down.

### **JET STRENGTH**

**MIN, DEFAULT, +1, MAX**

This adjustment changes the strength of the Jet Bumper coils.

### **SLING STRENGTH**

**MIN, DEFAULT, +1, MAX**

This adjustment changes the strength of the Slingshot coils.

### **AUTO PLUNGER STRENGTH**

**MIN, DEFAULT, +1, MAX**

This adjustment changes the strength of the Martian coils.

### **SHAKER STRENGTH**

**OFF, MIN, DEFAULT, MAX**

You can increase or decrease the strength of the shaker motor during play, or turn it off entirely.

## GAME FEATURES MENU

GAME FEATURES MENU – PRESS SERVICE TO ADVANCE

L POPPER STRENGTH	MAX
R POPPER STRENGTH	MAX
MARTIAN STRENGTH	MEDIUM

### LEFT POPPER STRENGTH

**-3, -2, -1, MAX**

This adjustment changes the strength of the Left Popper coil.

### RIGHT POPPER STRENGTH

**-3, -2, -1, MAX**

This adjustment changes the strength of the Right Popper coil.

### MARTIAN STRENGTH

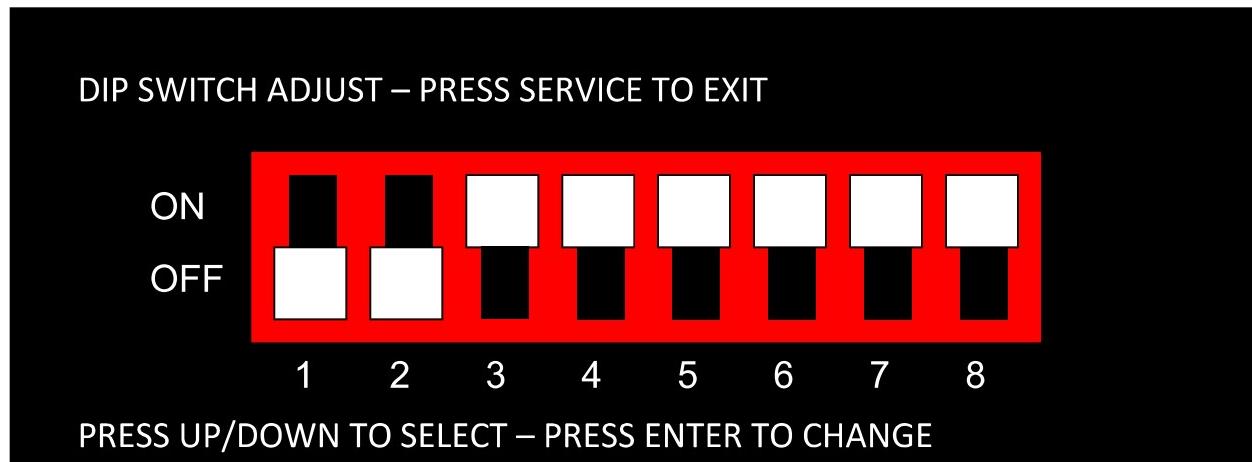
**LIGHT, MEDIUM, STRONG, OFF**

This adjustment changes the strength of the Martian coils.

## DIP SWITCH SETTINGS

DIP Switch settings may be adjusted in the CGC System Menu

After changing DIP switch Settings, you will have to enter the Main Menu or power cycle the game to apply the new settings.

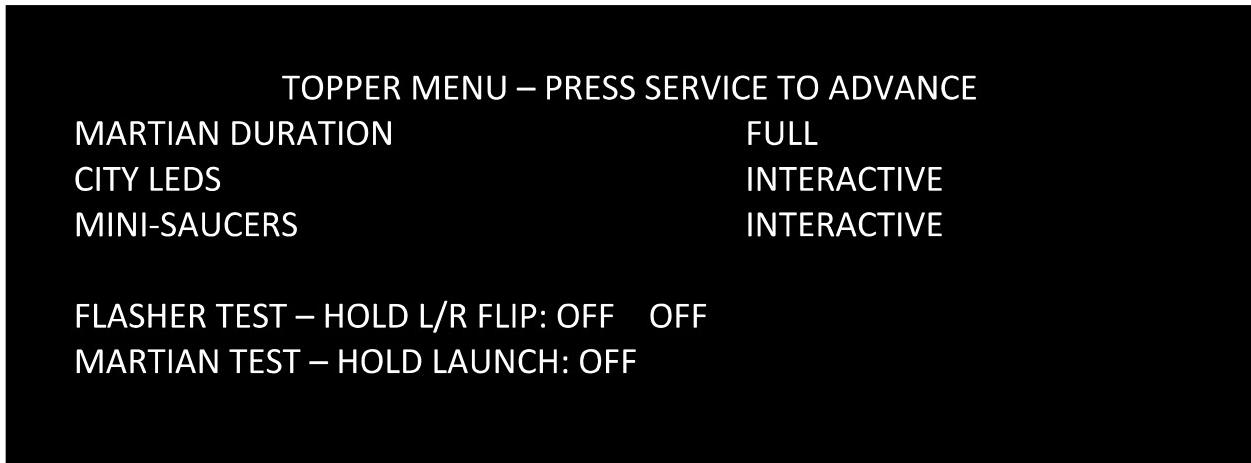


COUNTRY	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
AMERICA	OFF	OFF	ON	ON	ON	ON	ON	ON
EUROPEAN	OFF	OFF	ON	ON	ON	OFF	ON	ON
FRENCH	OFF	OFF	ON	ON	ON	ON	OFF	OFF
GERMAN	OFF	OFF	ON	ON	ON	ON	ON	OFF
SPAIN	OFF	OFF	ON	ON	OFF	ON	ON	ON

**NOTE: CHANGING DIP SWITCH SETTINGS WILL CLEAR ALL HIGH SCORES AND PERFORM A FACTORY RESET!**

## TOPPER MENU

The Topper Menu is used to adjust the colors of LEDs on the topper, how long the Martian Motor runs in game, and to test all components of the topper.



### MARTIAN DURATION

**LIGHT, FULL, OFF, DEFAULT: FULL**

This adjustment changes how long the Martian Motor runs. When set to FULL, the Martian will shake whenever the Martian speaks in game. To reduce the length of how long the motor runs, set this option to LIGHT. To prevent the Martian from ever shaking, set it to OFF.

### CITY LEDS

**OFF, RED, GREEN, BLUE, INTERACTIVE, DEFAULT: INTERACTIVE**

The RED, GREEN, or BLUE settings will force the RGS LED strips in the topper to stay on in that one color. When set to INTERACTIVE, the City LEDs will change colors and flash, triggered by events in the game. To test the City LEDs, change this setting, and check that the City LEDs are lighting while in the menu.

### MINI-SAUCERS

**OFF, ON, INTERACTIVE, DEFAULT: INTERACTIVE**

The RED, GREEN, or BLUE settings will force the speaker LEDs to stay on in that one color. When set to INTERACTIVE, the speaker LEDs will change colors and flash, triggered by events in the game. To test the Mini-Saucers, change this setting, and check that the mini-saucers are lighting while in the menu.

### FLASHER TEST

Press the left or right flipper to light the left or right flashers in the topper. The display will show whether a flasher should be on or off.

### MARTIAN TEST

Press and hold **LAUNCH** to run the Martian Motor. The display will show whether the motor is on or off.

### MOTOR STOP SWITCH

To test the motor stop switch, you will need to remove the backbox insert panel so you can see the Topper PCB. The LED on the topper board marked STAT will light when the switch is pressed.

## MENU SYSTEM OPERATION

The Main Menu allows you to choose from several categories, which in turn lead to other menus. To access the Main Menu, open the coin door and press the Begin Test button, then press the Enter button. Press the Up or Down buttons to cycle through the Main Menu. Press the Enter button to access a menu. Press the Escape button to return to the Main Menu. Press the Start button for HELP at any time.

### **Main Menu**

#### B. Bookkeeping Menu

	B.1 Main Audits
	B.2 Earnings Audits
	B.3 Standard Audits
	B.4 Feature Audits
	B.5 Histograms
	B.6 Time-Stamps

#### T. Test Menu

	T.1 Switch Edges
	T.2 Switch Levels
	T.3 Single Switches
	T.4 Solenoid Test
	T.5 Flasher Test
	T.6 General Illumination
	T.7 Sound & Music Test
	T.8 Single Lamps
	T.9 All Lamps
	T.10 Lamp & Flasher Test
	T.11 Display Test
	T.12 Flipper Test
	T.13 Ordered Lamp Test
	T.14 Lamp Row-Col Test
	T.15 Dip Switch Test
	T.16 Loop/Gate Test
	T.17 Saucer LED Test
	T.18 Drop Target Test
	T.19 Motor Bank Test
	T.20 Empty Balls Test

#### U. Utilities Menu

	U.1 Clear Audits
	U.2 Clear Coins
	U.3 Reset H.S.T.D.
	U.4 Set Time & Date
	U.5 Custom Message
	U.6 Set Game I.D.
	U.7 Factory Adjustments
	U.8 Factory Resets
	U.9 Presets
	U.10 Clear Credits
	U.11 Auto Burn-In

#### A. Adjustments Menu

	A.1 Standard Adjustments
	A.2 Feature Adjustments
	A.3 Pricing Adjustments
	A.4 H.S.T.D. Adjustments
	A.5 Printer Adjustments

#### **Press Escape**

To move out of a menu selection.

#### **Press Enter**

To get into a menu selection.

#### **Press Up**

Increases sequence; Example A.1, A.2, A.3, A.4.

#### **Press Down**

Decreases Sequence; Example A.4, A.3, A.2, A.1.

Use Up and Down to cycle through the selections in a menu.

Use Escape and Enter to move into and out of the selected menu

Press the Up or Down buttons to cycle through the menu. Press the Enter button to access an audit menu. Press the Escape button to return to the Bookkeeping Menu.

## **B. BOOKKEEPING MENU**

- B.1 Main Audits**
- B.2 Earning Audits**
- B.3 Standard Audits**
- B.4 Feature Audits**
- B.5 Histograms**

### **B.6 Time-Stamp**

**One Button Audit System.** The Bookkeeping Menu is obtainable directly from the Attract Mode. Repeatedly pressing the Enter button, while in the Attract Mode, will cycle through all of the game audits.

#### **B.1 Main Audits**

B.1 01 Total Earnings	00	B.1 06 Total Plays	00
B.1 02 Recent Earnings	00	B.1 07 Replay Awards	00
B.1 03 Free Play Percent	00	B.1 08 Percent Replays	00
B.1 04 Average Ball Time	00	B.1 09 Extra Balls	00
B.1 05 Time Per Credit	00	B.1 10 Percent Extra Ball	00

#### **B.2 Earning Audits\***

B.2 01 Recent Earnings	00	B.2 08 Total Earnings*	00
B.2 02 Recent Left Slot	00	B.2 09 Total Left Slot*	00
B.2 03 Recent Center Slot	00	B.2 10 Total Center Slot*	00
B.2 04 Recent Right Slot	00	B.2 11 Total Right Slot*	00
B.2 05 Recent 4th Slot	00	B.2 12 Total 4th Slot*	00
B.2 06 Recent Paid Credits	00	B.2 13 Total Paid Credits*	00
B.2 07 Recent Service Credits	00	B.2 14 Total Service Credits*	00

\*These audits are NOT resettable. They are a record of the earnings of the game since the "CLOCK 1ST SET" Time-Stamp.

#### **B.3 Standard Audits**

B.3 01 Games Started	00	B.3 20 Time Per Credit	00
B.3 02 Total Plays**	00	B.3 21 Play Time	00:00:00
B.3 03 Total Free Play	00	B.3 22 Minutes On	00
B.3 04 Free Play Percent	00	B.3 23 Balls Played	00
B.3 05 Replay Awards	00	B.3 24 Tilts	00
B.3 06 Percent Replays	00	B.3 25 Replay 1 Awards	00
B.3 09 Match Awards	00	B.3 28 Replay 4 Awards	00
B.3 10 Percent Match	00	B.3 29 1 Player Games	00
B.3 11 H.S.T.D. Credits	00	B.3 30 2 Player Games	00
B.3 12 Percent H.S.T.D	00	B.3 31 3 Player Games	00
B.3 13 Extra Balls	00	B.3 32 4 Player Games	00
B.3 14 Percent Extra Ball	00	B.3 33 H.S.T.D. Reset Count	00
B.3 15 Tickets Awarded	00	B.3 34 Burn-in Time †	00:00:00
B.3 16 Percent Tickets	00	B.3 35 1st Replay Level	00
B.3 17 Left Drains	00	B.3 36 Left Flipper	00
B.3 18 Right Drains	00	B.3 37 Right Flipper	00
B.3 19 Average Ball Time	00		

\*\* "Total Plays" only counts completed games. A game is considered complete when the final ball begins. Audit information from incomplete games is ignored, therefore test and servicing operations do not affect the Audits.

† This Audit is not resettable.

## B.4 Feature Audits

B.4 01	Ball Saves The number of times the ball was saved.	0%	00
B.4 02	Total Multi-balls The number of times a Multi-ball feature was started.	0%	00
B.4 03	Attack Wave Start The number of times an Attack Wave was started.	0%	00
B.4 04	Attack Wave Completed The number of times an Attack Wave was completed.	0%	00
B.4 05	Attack Wave Extra Ball Lit The number of times the Attack Wave Extra Ball was lit.	0%	00
B.4 06	Locks Lit The number of times a lock was lit.	0%	00
B.4 07	Balls Locked The number of times a ball was locked.	0%	00
B.4 08	Main Multi-ball Start The number of times Main Multi-ball was started.	0%	00
B.4 09	Main Multi-ball Jackpots The number of Main Multi-ball Jackpot awards.	0%	00
B.4 10	Main Multi-ball Super Jackpots The number of Main Multi-ball Super Jackpot awards.	0%	00
B.4 11	First Attack Wave Started The number of times the first Attack Wave was started.	0%	00
B.4 12	First Attack Wave Completed The number of times the first Attack Wave was completed.	0%	00
B.4 13	Second Attack Wave Started The number of times the second Attack Wave was started.	0%	00
B.4 14	Second Attack Wave Completed 00 The number of times the second Attack Wave was completed.	0%	
B.4 15	Third Attack Wave Started The number of times the third Attack Wave was started.	0%	00
B.4 16	Third Attack Wave Completed The number of times the third Attack Wave was completed.	0%	00
B.4 17	Fourth Attack Wave Started The number of times the fourth Attack Wave was started.	0%	00

## B.4 Feature Audits Continued

B.4 18	Fourth Attack Wave Completed The number of times the fourth Attack Wave was completed.	0%	00
B.4 19	Fifth Attack Wave Started The number of times the fifth Attack Wave was started.	0%	00
B.4 20	Fifth Attack Wave Completed The number of times the fifth Attack Wave was completed.	0%	00
B.4 21	Sixth Attack Wave Started The number of times the sixth Attack Wave was started.	0%	00
B.4 22	Sixth Attack Wave Completed The number of times the sixth Attack Wave was completed.	0%	00
B.4 23	Hurry Up Awards The number of Hurry Up awards.	0%	00
B.4 24	Total Annihilation Started The number of times Total Annihilation was started.	0%	00
B.4 25	Total Annihilation Awards The number of Total Annihilation awards.	0%	00
B.4 26	Total Annihilation Jackpots The number of Total Annihilation jackpots.	0%	00
B.4 27	Martian Targets Completed The number of times the Martian targets were completed.	0%	00
B.4 28	Martian Attack Started The number of times the Martian Attack feature was started.	0%	00
B.4 29	Martian Attack Kills The number of Martians killed during Martian Attack.	0%	00
B.4 30	Martian Bombs Collected The number of Martian bombs collected.	0%	00
B.4 31	Martian Bombs Used The number of Martian bombs used.	0%	00
B.4 32	Martian Multi-ball Started The number of times the Martian Multi-ball feature was started.	0%	00
B.4 33	Martian Multi-ball Kills The number of Martians killed during Martian Multi-ball.	0%	00
B.4 34	5-Way Combos The number of 5-way Combos.	0%	00

## B.4 Feature Audits Continued

B.4 35	Super Jets Started The number of times the Super Jets feature was started.	0%	00
B.4 36	Rule The Universe Started The number of times the Rule The Universe feature was started.	0%	00
B.4 37	Rule The Universe Won The number of times the Rule The Universe feature was won.	0%	00
B.4 38	Skill Shot Awards The number of Skill Shot awards.	0%	00
B.4 39	Super Skill Shot Awards The number of Super Skill Shot awards.	0%	00
B.4 40	Bonus Multiplier Awards The number of Bonus Multiplier awards.	0%	00
B.4 41	Bottom Lanes Completed The number of times the bottom lanes were completed.	0%	00
B.4 42	Bottom Lane Extra Ball Lit The number of times the bottom lane Extra Ball was lit.	0%	00
B.4 43	Random Awards The number of Stroke Of Luck random awards given.	0%	00
B.4 44	Random Award - Light Extra Ball The number of times "Light Extra Ball" was given as a random award.	0%	00
B.4 45	Strobe Multi-ball Started The number of times the Strobe Multi-ball feature was started.	0%	00
B.4 46	Strobe Extra Ball Lit The number of times an Extra Ball was lit from the Strobe Multi-ball feature.	0%	00
B.4 47	Video Mode Started The number of times Video Mode was started.	0%	00
B.4 48	Video Mode Extra Ball Lit The number of times an Extra Ball was lit from Video Mode.	0%	00
B.4 49	Sneak Attack Started The number of times the Sneak Attack feature was started.	0%	00
B.4 50	Sneak Attack Completed The number of times the Sneak Attack feature was completed.	0%	00
B.4 51	Novice Modes The number of "Novice Mode" games played.	0%	00
B.4 52	Buy In Extra Balls The number of times an Extra Ball was bought.	0%	00

## **B.5 Histograms**

B.5	01	0 - 199 Million Scores	00%
B.5	02	200 - 399 Million Scores	00%
B.5	03	400 - 599 Million Scores	00%
B.5	04	600 - 799 Million Scores	00%
B.5	05	800 - 999 Million Scores	00%
B.5	06	1 - 1.49 Billion Scores	00%
B.5	07	1.5 - 1.99 Billion Scores	00%
B.5	08	2 - 2.99 Billion Scores	00%
B.5	09	3 - 3.99 Billion Scores	00%
B.5	10	4 - 4.99 Billion Scores	00%
B.5	11	5 - 6.99 Billion Scores	00%
B.5	12	7 - 8.99 Billion Scores	00%
B.5	13	Over 9 Billion	00%
B.5	14	Game Time 0.0 - 1.0 Mins	00%
B.5	15	Game Time 1.0 - 1.5 Mins	00%
B.5	16	Game Time 1.5 - 2.0 Mins	00%
B.5	17	Game Time 2.0 - 2.5 Mins	00%
B.5	18	Game Time 2.5 - 3.0 Mins	00%
B.5	19	Game Time 3.0 - 3.5 Mins	00%
B.5	20	Game Time 3.5 - 4.0 Mins	00%
B.5	21	Game Time 4 - 5 Mins	00%
B.5	22	Game Time 5 - 6 Mins	00%
B.5	23	Game Time 6 - 8 Mins	00%
B.5	24	Game Time 8 - 10 Mins	00%
B.5	25	Game Time 10 - 15 Mins	00%
B.5	26	Game Time Over 15 Mins	00%

## **B.6 Time-Stamp**

The Time-Stamp Menu allows you to view dates and times that are important to game software.

B.6	01	Current Time
B.6	02	Totals Cleared
B.6	03	Clock Last Set
B.6	04	Audits Cleared
B.6	05	Coins Cleared
B.6	06	Factory Setting
B.6	07	Last Game Start
B.6	08	Last Replay
B.6	09	Last H.S.T.D. Reset
B.6	10	Champion Reset
B.6	11	Last Printout
B.6	12	Last Service Credit

**AFMr does not require the Service Switch Actuator to hold in the top interlock switch located in the bottom leftcorner of the coin door opening. Pull the actuator on the top coin door switch until it locks in place in order to activate the solenoids and flashlamps.**

Press the Up or Down buttons to cycle through the menu. Press the Enter button to access a test. Press the Escape button to return to the Test Menu.

**Note:** During any test, if you press the Start button, the information shown about the wire color, driver number, connector number and fuse location is not accurate. This is old information from the original game.

#### T. TEST MENU

- T.1      Switch Edges
- T.2      Switch Levels
- T.3      Single Switch
- T.4      Solenoid Test
- T.5      Flasher Test
- T.6      General Illumination
- T.7      Sound & Music Test
- T.8      Single Lamps
- T.9      All Lamps
- T.10     Lamp & Flasher Tests
- T.11     Display Test
- T.12     Flipper Test
- T.13     Ordered Lamps Test
- T.14     Lamp Row-Col Test
- T.15     Dip Switch Test
- T.16     Loop/Gate Test
- T.17     Saucer LED Test
- T.18     Drop Target Test
- T.19     Motor Bank Test
- T.20     Empty Balls Test

NOTE: Attack From Mars DOES NOT use a switch matrix

**T.1 Switch Edges**      Press each switch one at a time. The name and number of the switch is shown in the display. If a switch other than the one pressed, or no switch at all is indicated, the system has detected a problem with the switch circuit.

**T.2 Switch Levels**      This test automatically cycles through all switches that are detected closed. The name and number of each switch that is detected is shown in the display. A filled square indicates the switch's position in the matrix.

**T.3 Single Switches** The Single Switch Test isolates a particular switch by blocking signals from all other switches. Use the Up or Down buttons to select the switch to be tested.

**T.4 Solenoid Test** The Solenoid Test has three modes: Repeat, Stop, and Run. Only one solenoid should pulse at a time. The system has detected a problem if; more than one solenoid pulses, a solenoid comes On and stays On, or no solenoids pulse during the Repeat or Run modes.

- |        |  |
|--------|--|
| Repeat | - The Repeat Mode pulses a single solenoid. After entering this test, Solenoid 1 shows in the display, and the corresponding solenoid activates. Press the Up or Down button to cycle through the solenoids, one at a time. The same solenoid pulses until the Up or Down button is pressed. Either press the Escape button to return to the Test Menu, or press the Enter button to advance to the next mode. |
| Stop   | - The Stop Mode halts the Solenoid Test. Press Enter during the Repeat mode and the Solenoid Test Stops. No solenoids should be activated while the test is stopped. Either press the Escape button to return to the Test Menu, or the Enter button to advance to the next mode.   |
| Run    | - The Run Mode cycles through the solenoids automatically. The display shows the name and number of the solenoid currently being pulsed. Either press the Escape button to return to the Test Menu, or the Enter button to advance to the next mode.   |

**T.5 Flasher Test** This tests the flashlamp part of the solenoid circuit exclusively. This, like the Solenoid Test has three test modes: Repeat, Stop, and Run. During this test, only one flashlamp circuit should pulse at a time. The system has detected a problem if more than one circuit pulses, a circuit stays On, or no circuits pulse during the Repeat or Run modes.

- |        |   |
|--------|---|
| Repeat | - The Repeat mode pulses a single flashlamp. After entering this test, the name and number of the first flashlamp circuit will show in the display and the corresponding bulb(s) flash. Press the Up or Down button to cycle through all of the flashlamp circuits one at a time. The same circuit pulses until the Up or Down button is pressed. Either press the Escape button to return to the Test Menu, or press the Enter button to advance to the next mode. |
| Stop   | - The Stop Mode halts the Flasher Test. No flashlamp circuit should be active during this mode. Either press the Escape button to return to the Test Menu, or the Enter button to advance to the next mode.   |
| Run    | - The Run Mode cycles through the flashlamps automatically. The display shows the name and number of the flashlamp circuit currently being pulsed and the corresponding bulb(s) flash. Either press the Escape button to return to the Test Menu, or the Enter button to advance to the next mode.  |

**T.6 General Illumination** This test checks all of the General Illumination circuits. There are two modes of operation: Stop and Run. **Note: G.I strings 4 and 5 do not dim and brighten, they are always ON.**

- |      |  |
|------|--|
| Stop | - Press the Up or Down buttons to cycle through the General Illumination Test manually. All illumination is tested first, followed by an individual circuit test. The circuit name and number will show in the display while the corresponding lamps light. If any other results occur the system has detected an error. |
| Run  | - Press the Enter button any time during Stop mode and the General Illumination Test cycles through automatically. For each circuit shown in the displays the corresponding bulbs should light. If any other results occurs the system has detected a problem.   |

**T.7 Sound and Music Test** The Sound and Music Test allows you to check the audio circuits. This test has three modes for testing the sound and music circuits: Run, Repeat, and Stop.

- |        |   |
|--------|---|
| Run    | - The Run Mode steps through a sequence of sounds and music. Pressing the Up or Down button during this portion of the Sound and Music test advances to a particular sound/tune without having to wait for the program to play all the sounds available in the test. A sound/tune should be heard for each name and number that appears in the display. Any other results indicate the system has detected a problem. |
| Repeat | - Press the Enter button at any time during the Run Mode to cause the program to stop and repeat a particular sound/tune. The same sound should repeat continuously until the Up or Down button is pressed. Any other results indicates the system has detected a problem.  |
| Stop   | - Press the Enter button at any time during the Repeat Mode to stop this test altogether. No sound/tune should be heard. Any other results indicates the system has detected a problem.   |

**T.8 Single Lamp Test** The number assigned to each lamp indicates the lamp's position in the matrix. The number on the left indicates the column. The number on the right indicates the row. Example: Lamp 23 means 2nd column, 3rd row.

This test checks each lamp circuit individually. Press the Up or Down button to cycle through this test. For each name and number that is shown in the display the corresponding lamp should light. Any other results indicate the system has detected a problem.

**T.9 All Lamps Test** This test causes all the controlled lamps to flash at the same time. Every controlled lamp should flash. Any other results indicate the system has detected a problem.

**T.10 Lamp and Flasher Test** This test causes all the flashlamps and the controlled lamps to flash at the same time. The controlled lamps blink, while the flashlamps cycle from highest to lowest. Any other results indicates the system has detected a problem.

**T.11 Display Test** This test automatically lights every dot in the Dot Matrix Display. A series of patterns appear in sequence. Each pattern turns On and Off a section of dots. Every dot on the display should be turned On and Off during this test.

**T.12 Flipper Coil Test** The Flipper Coil Test has three modes: Repeat, Stop, and Run. Only one flipper should pulse at a time. The system has detected a problem if more than one flipper pulses, a flipper comes On and stays On, or no flippers pulse during the Repeat or Run modes.

- |        |  |
|--------|--|
| Repeat | - The Repeat Mode pulses a single flipper. After entering this test, coil 01 shows in the display and the corresponding flipper activates. Press the Up or Down button to cycle through the flipper coils, one at a time. The same flipper coil pulses until the Up or Down button is pressed. Either press the Escape button to return to the Test Menu, or press the Enter button to advance to the next mode. |
| Stop   | - The Stop Mode halts the Flipper Coil Test. Press Enter during the Repeat mode and the Flipper Coil Test stops. No flipper coil should be activated while the test is stopped. Either press the Escape button to return to the Test Menu, or the Enter button to advance to the next mode.  |
| Run    | - The Run Mode cycles through the flippers automatically. The display shows the name and number of the flipper coil currently being pulsed. Either press the Escape button to return to the Test Menu, or the Enter button to advance to the next mode.  |

**T.13 Ordered Lamp Test** The number assigned to each lamp indicates the lamp's position in the matrix. The number on the left indicates the column. The number on the right indicates the row. Example - Lamp 23 means 2nd column, 3rd row.

This test checks each lamp circuit individually. Press the Up or Down button to cycle through the lamps. Lamps light in a clock-wise or counter clock-wise direction starting from the bottom of the playfield. Direction depends on which button, Up or Down, is pressed. For each name and number that is shown in the display the corresponding lamp should light. Any other results indicates the system has detected a problem.

**T.14 Lamp Row-Col Test** This test allows individual rows and columns in the lamp matrix to be operated. This is useful for trouble-shooting wiring and driver problems.

Press the UP or DOWN buttons to cycle trough the different rows and columns.

**T.15 Dip Switch Test** This test is used to show the positions of the dip switches in the CGC System Menu.

**T.16 Loop/Gate Test** This test is used to verify proper ball delivery from the shooter lane onto the playfield, and to exercise the four (4) loop switches and the two (2) control gates.

To verify proper ball delivery from the shooter lane onto the playfield after entering this test:

- 1a) Verify that the coin door is closed.
- 2a) Press the start button to clear any error messages.
- 3a) Place a ball into the shooter lane, or press the launch button to eject a ball from the trough to the shooter lane.
- 4a) With a ball in the shooter lane, press the launch button to launch the ball onto the playfield. The left control gate should open when the ball is launched from the shooter lane. The ball should travel along the shooter lane, around the outer loop (from right to left), and be delivered cleanly to the left flipper at a reasonable speed.

To repeat the test, repeat steps 2a-4a.

To exercise the four (4) loop switches and the two (2) control gates after entering this test:

- 1b) Verify that the coin door is closed.
- 2b) Press the start button to clear any error messages.
- 3b) Roll a ball around either the left or the right loop. A sound is made as the ball passes over the loop switches, and the state of the loop switches are updated in the display. If the ball is traveling around the loop from left to right, the right control gate should open upon activation of the second left loop switch (L.HI). If the ball is traveling around the loop from right to left, the left control gate should open upon activation of the second right loop switch (R.HI). When the ball has finished its path around the loop (either from left to right, or from right to left), the test should report "TEST PASSED" on the display. Any other result indicates a problem with either the loop switches, or the control gates, or both.

To repeat the test, repeat steps 2b-3b.

During this test, the diagnostic test buttons on the coin door act as follows:

Escape: This button returns to the previous menu.

**T.17 Saucer L.E.D. Test** This test is used to exercise the L.E.D.'s in the saucer. The test has two modes: Automatic and Manual.

In automatic mode, a single L.E.D. will light up in the saucer. The lit L.E.D. will then move automatically around the saucer in a clockwise manner. The position of the lit L.E.D. is shown in the display.

In manual mode, a single L.E.D. will light up in the saucer. The up (+) button moves the lit L.E.D. around the saucer in a clockwise manner. The down (-) button moves the lit L.E.D. around the saucer in a counterclockwise manner. Holding down the up (+) button or the down (-) button moves the lit L.E.D. RAPIDLY around the saucer. The position of the lit L.E.D. is shown in the display.

The lit L.E.D. is always shown in the display for both test operation modes. Should there not be a lit L.E.D. on the saucer for the position of the L.E.D. indicated in the display, then the test has detected a problem with the L.E.D.

During this test, the diagnostic test buttons on the coin door act as follows:

- Escape: This button returns to the previous menu.
- Down: In Manual Mode, this button rotates the lit L.E.D. around the saucer in a counterclockwise manner.
- Up: In Manual Mode, this button rotates the lit L.E.D. around the saucer in a clockwise manner.
- Enter: This button toggles the state of the test between Automatic Mode and Manual Mode.

**T.18 Drop Target Test** This test allows the drop target to be activated while the state of the drop target switch is shown in the display.

There is only one coil for the drop target; this coil raises the target. The test has no way of getting the drop target to its "down" position; this must be done manually.

When the test detects that the drop target is down (by checking to see if the drop target switch is closed), the drop target coil will be activated to reset the drop target to its "up" position. The coil will operate only if the coin door is closed.

Any errors accumulated by this test are shown in the display.

During this test, the diagnostic test buttons on the coin door act as follows:

- Escape: This button returns to the previous menu.
- Enter: This button toggles the state of the test between Running and Stopped.

**T.19 Motor Bank Test** This test allows the motor bank to be activated while the state of the motor bank switches are shown in the display.

This test will continually run the motor bank up and down (with small pauses when a motor bank switch edge is detected) while the test is running. Errors are accumulated, and shown in the display.

If the test accumulates enough errors for the motor bank, the test will stop and show the errors in the display.

During this test, the diagnostic test buttons on the coin door act as follows:

Escape: This button returns to the previous menu.

Enter: This button toggles the state of the test between Running and Stopped.

**T.20 Empty Balls Test** This test kicks out all balls loaded in troughs, lockups, poppers, and kickouts until no balls remain in those locations.

Note: As the trough kicks out balls, they will stack up in the shooter groove, which may require manual clearing in order to allow further balls to be kicked out.

Press the Up or Down buttons to cycle through the menu. Press the Enter button to access a utility. Press the Up or Down buttons to see the setting choices. Press the Enter button to lock in a choice. If a mistake is made, press Escape while "Saving Adjustment Value" is in the display. The original settings is retained and the new settings is ignored. Press the Escape button to return to the Utility Menu.

## **U. UTILITIES MENU**

- U.1 Clear Audits**
- U.2 Clear Coins**
- U.3 Reset H.S.T.D.**
- U.4 Set Time & Date**
- U.5 Custom Message**
- U.6 Set Game I.D.**
- U.7 Factory Adjustments**
- U.8 Factory Resets**
- U.9 Presets**
- U.10 Clear Credits**
- U.11 Auto Burn-in**

**U.1 Clear Audits** Press the Enter button to clear the Standard Audits (except Burn-In Time), Feature Audits, and Histograms.

**U.2 Clear Coins** Press the Enter button to clear the Earnings Audits.

**U.3 Reset H.S.T.D.** Press the Enter button to clear the High Score to Date Table and the Grand Champion.

**U.4 Set Time and Date** Press the Enter button to activate the time and date. Use the Up or Down button to change the value, then press the Enter button to lock in that value. If a mistake is made, press the Escape button while "Saving New Date And Time" is displayed. The new value is ignored and the original value is retained.

**U.5 Custom Message** Set A.1 20 to ON before writing a Custom Message. Press the Enter button to begin entry of the custom message. Use the Up or Down button to cycle through letters. Use the Start button to cycle through punctuation marks. Press the Enter button to lock in the desired letter and punctuation. If you make a mistake, use Up and Down to select the "back-arrow" character. The "back-arrow" character is located before the space character and after the number nine. Press Enter while the back-arrow shows to erase the previously entered character. Once your message is complete, press and hold the Enter button until "Message Stored" is displayed.

Press the Escape button to cancel the new message. The message "Press Enter to Reset" appears. If you press Enter, the custom message is cleared and no message is displayed. If Escape is pressed, the original message remains intact.

**U.6 Set Game I.D.** This utility allows the operator to install a message, such as game location, that only appears on printouts . Press the Enter button to activate Set Game I.D.. Use the Up or Down button to cycle through letters. Use the Start button to cycle through punctuation marks. Press the Enter button to lock in the desired letter and punctuation.

**U.7 Factory Adjustment** Press the Enter button to restore the adjustments to factory settings.

**U.8 Factory Reset** Press the Enter button to restore the adjustments to their factory setting, clear the Audits, H.S.T.D Table, and Custom Message/Game I.D.

**U.9 Presets** Use the Up or Down buttons to cycle through the available Presets. When the desired Preset is displayed, press the Enter button to lock in that Preset. If a mistake is made, press the Escape button while “Executing...” is displayed. The new value is ignored and the original value is retained.

**Game Difficulty Levels** The game play difficulty adjustments can be changed to a combination that is MUCH LESS to MUCH MORE difficult than Factory Settings. The Game Difficulty Setting Table lists the adjustments and settings that comprise the individual groups.

**U.9 01 Install Extra Easy** MUCH LESS difficult than factory setting.

**U.9 02 Install Easy** Somewhat LESS difficult than factory setting.

**U.9 03 Install Medium** About the SAME as factory setting.

**U.9 04 Install Hard** Somewhat MORE difficult than factory setting.

**U.9 05 Install Extra Hard** MUCH MORE difficult than factory setting.

#### **Game Difficulty Setting Table for U.S./Canadian/French Games**

Adj. No.	Adjustment Description	Extra Easy U.9_01	Easy U.9_02	Medium U.9_03	Hard U.0_04	Extra Hard U.9_05
A.2 03	Ball Saves	02	01	01	01	OFF
A.2 04	Ball Save Time	06	05	04	03	N/A
A.2 05	Extra Ball Percent	35%	30%	25%	20%	15%
A.2 07	Lane Extra Ball	6	8	10	12	14
A.2 10	Attack Wave Start Difficulty	EASY	EASY	EASY	HARD	HARD
A.2 11	Attack Wave Difficulty	EX. EASY	EASY	MEDIUM	HARD	EX. HARD
A.2 12	First Hard Lock	03	02	02	02	01
A.2 13	Super Jackpot Timer	14	12	10	08	06
A.2 14	Martian Target Memory	YES	YES	YES	YES	NO
A.2 15	Martian Attack Start Difficulty	EASY	EASY	EASY	HARD	HARD
A.2 16	Martian Attack Timer	40	35	30	25	20

#### **Game Difficulty Setting Table for German/European Games**

Adj. No.	Adjustment Description	Extra Easy U.9_01	Easy U.9_02	Medium U.9_03	Hard U.0_04	Extra Hard U.9_05
A.2 03	Ball Saves	02	01	01	01	OFF
A.2 04	Ball Save Time	06	05	04	03	N/A
A.2 05	Extra Ball Percent	35%	30%	25%	20%	15%
A.2 07	Lane Extra Ball	6	8	10	12	14
A.2 10	Attack Wave Start Difficulty	EASY	EASY	EASY	HARD	HARD
A.2 11	Attack Wave Difficulty	EX. EASY	EASY	MEDIUM	HARD	EX. HARD
A.2 12	First Hard Lock	03	02	02	02	01
A.2 13	Super Jackpot Timer	14	12	10	08	06
A.2 14	Martian Target Memory	YES	YES	YES	YES	NO
A.2 15	Martian Attack Start Difficulty	EASY	EASY	EASY	HARD	HARD
A.2 16	Martian Attack Timer	40	35	30	25	20

**N/A NON-APPLICABLE**

**U.9 06 Install 5 Ball**

**U.9 07 Install 3 Ball** Adjustments U.9 06 and U.9 07 can be used to change a game to 3 or 5 ball play, including the changing of certain features to the recommended 3- and 5-ball level. The Preset Game Adjustments Table for U.S./Canadian Games lists the adjustments and settings that comprise the individual groups.

**Preset Game Adjustments Table**

Adjustment Number	Adjustment Description	Install 3-Ball U.9 07 (factory)	Install 5 Ball U.9 06
A.1 01	Balls Per Game	03	05
A.1 07	Replay Start	4,000,000,000	5,500,000,000
A.2 06	Attack Wave Extra Ball	02	03
A.2 07	Lane Extra Ball	10	14
A.2 11	Attack Wave Difficulty	MEDIUM	HARD
A.2 12	First Hard Lock	02	01

**U.9 08 Install Add-A-Ball** This option deletes all Free Play awards and replaces them with Extra Ball awards. Individual adjustments are affected, as follows:

<u>Adjustment</u>	<u>Name</u>	<u>New Setting</u>
A.1 13	Replay Boost	Off
A.1 14	Replay Award	Extra Ball
A.1 15	Special Award	Extra Ball
A.1 17	Extra Ball Ticket	No
A.1 19	Match Feature	Off
A.4 04	Champion Credits	00
A.4 05	High Score 1 Credits	00
A.4 06	High Score 2 Credits	00
A.4 08	High Score 3 Credits	00
A.4 07	High Score 4 Credits	00
A.4 20	Alien Champion Credits	00

**U.9 09 Install Ticket** This option deletes Credit awards and replaces them with Ticket awards. Individual adjustments are affected, as follows:

<u>Adjustment</u>	<u>Name</u>	<u>New Setting</u>
A.1 14	Replay Award	Ticket
A.1 15	Special Award	Ticket
A.1 16	Match Award	Ticket
A.1 17	Extra Ball Ticket	Yes
A.1 31	Ticket Expansion Board	Yes
A.4 02	H.S.T.D. Award	Ticket

**U.9 10 Install Novelty** This option removes all Free Play and Extra Ball awards. Individual adjustments are affected, as follows:

<u>Adjustment</u>	<u>Name</u>	<u>New Setting</u>
A.1 04	Max. Extra Ball	Off
A.1 05	Replay System	Fixed
A.1 09	Replay Level 1	Off
A.1 10	Replay Level 2	Off
A.1 11	Replay Level 3	Off
A.1 12	Replay Level 4	Off
A.1 15	Special Award	Points
A.1 19	Match Feature	Off
A.4 01	Highest Score	On
A.4 04	Champion Credits	00
A.4 05	High Score 1 Credits	00
A.4 06	High Score 2 Credits	00
A.4 07	High Score 3 Credits	00
A.4 08	High Score 4 Credits	00
A.4 20	Alien Champion Credits	00

#### **U.9 11 Not Used**

**U.9 12 Serial Capture** This sets up the printer adjustments for serial transmission to a laptop computer (9600 baud, 40 column, no page breaks, serial printer). This option requires the installation of the optional printer kit, part number 63110.

#### **U.9 13 thru U.9 16 Not Used**

**U.9 17 Install German 1\***

**U.9 18 Install German 2\***

**U.9 19 Install German 3\***

**U.9 20 Install German 4\***

**U.9 21 Install German 5\***

**U.9 22 Install German 6\*** Adjustments U.9 17 through U.9 22 are used to modify game pricing and type of game play. The Preset Game Adjustments Table for German/European Games lists the adjustments and settings that comprise the individual groups.

**U.9 23 Install French 1\***

**U.9 24 Install French 2\***

**U.9 25 Install French 3\***

**U.9 26 Install French 4\***

**U.9 27 Install French 5\***

**U.9 28 Install French 6\*** Adjustments U.9 23 through U.9 28 are used to modify game pricing and type of play. The Preset Game Adjustments Table for French Games lists the adjustments and settings that comprise the individual groups.

\* The French DIP Switch Settings are:

<u>SW4</u>	<u>SW5</u>	<u>SW6</u>	<u>SW7</u>	<u>SW8</u>
On	On	On	Off	Off

**U.10 Clear Credits** Press the Enter button to clear the game Credits.

**U.11 Auto Burn-in** Press the Enter button to activate Auto Burn-in. This utility automatically cycles through several tests. This will help in find intermittent problems. The tests that Auto Burn-in cycle through are: the Display Test, Sound and Music Test, All Lamps Test, Solenoid Test, Flashers Test, General Illumination Test, and the Flipper Coil Test. All of the tests are run concurrently. The time spent on the current burn-in cycle, and the total time the game has spent in burn-in are displayed.

Press the Up or Down buttons to cycle through the menu. Press the Enter button to access an adjustment. Press the Up or Down buttons to see the setting choices. Press the Enter button to lock in a choice. If a mistake is made, press Escape while "Saving Adjustment Value" is in the display. The original settings is retained and the new value is ignored. Press the Escape button to return to the Adjustment Menu.

## **A. ADJUSTMENTS MENU**

- A.1 Standard Adjustments**
- A.2 Feature Adjustments**
- A.3 Pricing Adjustments**
- A.4 H.S.T.D Adjustments**
- A.5 Printer Adjustments** (optional board required)

### **A.1 Standard Adjustments**

#### **A.1 01 Balls Per Game**

A "game" is defined by specifying the number of balls to be played.

Range: 1-10

#### **A.1 02 Tilt Warnings**

The number of total actuation's of the plumb bob mechanism that can occur before the game is "tilted".

Range: 1-10

#### **A.1 03 Maximum Extra Balls**

The number of extra balls that a player may accumulate.

Range: 1-10

NO EXTRA BALL: - No Extra Balls may be accumulated.

#### **A.1 04 Maximum Extra Balls/Ball in Play**

The number of extra balls to be awarded per ball in play.

OFF - No maximum number of Extra Balls per ball in play.  
1-10 - 1 through 10 Extra Balls per ball in play.

#### **A.1 05 Replay System**

The type of replay system to be used.

Fixed - Replay value is set and does not change during game play.  
Auto % - Replay starting value is set and changes every 50 games to comply with the percentage of replays desired.

#### **A.1 06 Replay Percent\***

The percentage of replays the players are able to earn when Auto Replay is used.

Range: 5-50%

#### **A.1 07 Replay Start\***

The replay start value when Auto % Replay is used. The range of this setting is 500,000,000 to 9,500,000,000.

**A.1 08 Replay Levels\***

The number of replay levels used by the Auto % Replay mode. The range of this setting is 1 to 4. When two replay levels are chosen, the second replay level is automatically adjusted to twice the starting replay level value. When three or four replay levels are chosen, their values are automatically adjusted to three or four times the starting replay level.

\*For Auto % Replay.

**A.1 13 Replay Boost**

The replay score can be temporarily boosted by the selected amount EACH time the player reaches or exceeds the replay score. This temporary boost is canceled when credits equal 0, the player inserts another coin, or Begin Test is pressed.

Range: - Score is boosted between 200,000,000 and 2,500,000,000 points.  
OFF - Replay score is not boosted.  
AUTO - Replay score is boosted by  $\frac{1}{2}$  of the base replay score.

**A.1 14 Replay Award**

For the form of award automatically provided when the player exceeds any replay level for either Auto % Replay, or Fixed Replay.

Credit - Reaching each Replay level awards credit.  
Ticket - Reaching each Replay level awards a ticket.  
Ball - Reaching each Replay level awards an Extra Ball.  
Audit - Reaching each Replay level awards nothing to the player; it does increase the entry value of the Audit Item(s) maintaining a tally of these awards.

**A.1 15 Not Used****A.1 16 Match Award**

The award automatically provided when the player wins a match.

Credit - Winning a Match awards a Credit.  
Ticket - Winning a Match awards a Ticket.

**A.1 17 Extra Ball Ticket**

A Ticket is awarded when the player earns an Extra Ball.

YES - The player is awarded a Ticket in addition to an Extra Ball.  
NO - The player is not awarded a Ticket.

**A.1 18 Maximum Ticket/Player**

The amount of Tickets each player can earn.

Range 00 - 100

**A.1 19 Match Feature**

The desired percentage for the Match Feature occurring at the end of the game.

OFF - Match Feature is not available.

1 -50% - 1% is 'hard'; 50% is 'extremely easy'. The Match Feature selects a random two-digit number at the end of the game and compares each players score for an identical two digits in the rightmost two positions. A matching of these two digits results in an award of a Credit or a Ticket.

**A.1 20 Custom Message**

The message displayed during the Attract Mode.

YES - A message is displayed

NO - A message is not displayed.

**A.1 21 Language**

The language the game uses: English, German, French or Spanish.

**A.1 22 Clock Style**

The style of clock the game uses: A.M./P.M., or 24 Hours.

**A.1 23 Date Style**

The style of date the game uses: Month/Date/Year, or Date/Month/Year.

**A.1 24 Show Date and Time**

The date and time show in the Attract Mode.

YES - Show date and time in status report, or Attract Mode.

NO - Do Not show date and time in status report or Attract Mode.

**A.1 25 Allow Dim Illumination**

The game program dims the General Illumination for special effects and during the Attract Mode.

YES - Dim General Illumination for special effects and Attract Mode.

NO - Do Not dim General Illumination.

**A.1 26 Tournament Play**

Equalize random game features and global score values during multi-player games.

YES - Equalize random game features and global score values.

NO - Do Not equalize random game features and global score values.

**A.1 27 Euro. Scr. Format**

Use either commas or dots between digits when numbers are displayed.

YES - Dots instead of commas, (example 1.000.000).

NO - Commas instead of dots, (example 1,000,000).

**A.1 28 Minimum Volume Override**

The volume can be turned Off.

YES - Volume can be turned Off.

NO - Volume can be turned Down but not Off.

**A.1 29 General Illumination Power Saver**

This allows the general illumination and controlled lamps to be dimmed following a time interval after a game is played. Power Saver Level (A.1 30) determines dimness of the lamps. Using this feature will substantially increase the life of the lamps.

Setting: - Off, 2-60 Minutes

**A.1 30 Power Saver Level**

When General Illumination Power Saver (A.1 29) is set to On, this controls the intensity of the G.I. and controlled lamps once the game has been idle for a specified period of time.

Range: 4-7 (4 = dimmest, 7 = brightest)

**A.1 31 Ticket Expansion Board**

When a Ticket Expansion Board is connected, full control of the ticket dispenser is available. This includes a ticket low/error lamp, resume on ticket jam switch, and manual ticket dispense switch.

Yes - Ticket Expansion Board is connected.  
No - Ticket Expansion Board is NOT installed in the game.

**A.1 32 No Bonus Flips**

The activation of flippers during the end of ball "bonus" sequence. Setting this to "YES" may extend the life of the flipper mechanisms.

**A.1 33 Game Restart**

When the start button is pressed during or after the 2nd ball, the game in progress will end and a new game will begin. This adjustment has 3 settings to determine how this is handled.

Never: - Do not allow a new game to start until the current game is over.  
Slow: - Restart if the start button is pressed continuously for over 1/2 second. This helps to prevent the unintended restart of game in progress.  
Instantly: - Restart as soon as the start button is pressed.

When the start button is pressed during game over, or during the 1st ball (to add a player), it is always handled instantly.

## A.2 Feature Adjustments

### A.2 01 Buy Extra Ball

This adjustment determines whether each player may buy an Extra Ball at the end of a game.

OFF: No Extra Balls may be purchased.

1/2 CREDIT: An Extra Ball may be purchased for 1/2 credit.

1 CREDIT: An Extra Ball may be purchased for 1 credit.

### A.2 02 Buy Extra Ball Count

This adjustment specifies the number of Extra Balls that may be bought by each player at the end of a game. **Note:** This adjustment is shown when "A.2 01 Buy Extra Ball" is set to ½ Credit or 1 Credit.

01-03: 01 to 03 Extra Balls may be bought.

UNLIMITED: An unlimited number of Extra Balls may be bought.

### A.2 03 Ball Saves

This adjustment determines the number of "full" Ball Saves that each player receives in a game. A ball that is "saved" will be returned to play without a change in the player up number or the ball in play number. A "full" Ball Save is "used" if a ball drains after it is launched into play within the amount of time specified in A.2 04 (Ball Save Time). Once all "full" Ball Saves are used, balls will no longer be returned to play should they drain quickly after being launched into play.

OFF: Balls will not be saved.

01-05: 01 to 05 "full" Ball Saves given to each player per game.

### A.2 04 Ball Save Time

This adjustment determines the number of seconds in which a ball may drain after being launched into play, such that it will be returned to play without a change in the player up number or the ball in play number. **Note:** This adjustment is shown when "A.2 03 Ball Saves" is set for 01 to 05 saves.

03-15: 03 to 15 seconds.

### A.2 05 Extra Ball Percent

This adjustment determines the total percentage of Extra Balls desired (for all Extra Balls awarded from all features except Replay Score levels). The game will adjust the percentage of the Stroke Of Luck "Light Extra Ball" award to achieve the requested level (the percentage for this random award normally runs between 1% and 10%). When this adjustment is set to FIXED, no automatic百分比化 will be done for the Stroke Of Luck "Light Extra Ball" award; it will operate with a FIXED percentage of 5%.

FIXED: Do not percentage the Stroke Of Luck "Light Extra Ball" award.

15-40: Percentage the Stroke Of Luck "Light Extra Ball" award to achieve this percentage.

### A.2 06 Attack Wave Extra Ball

This adjustment specifies the number of Attack Waves that need to be completed to light an Extra Ball.

OFF: Do not light an Extra Ball after completing an Attack Wave.

01-05: Light an Extra Ball after completing this number of Attack Waves.

**A.2 07 Lane Extra Ball**

This adjustment specifies the number of times the Bottom Rollover Lanes need to be completed to light an Extra Ball.

OFF: Do not light an Extra Ball from the Bottom Lanes.

01-20: Light an Extra Ball after completing this number of Bottom Lanes.

**A.2 08 Strobe Multi-ball Extra Ball**

This adjustment specifies the number of times the Center Target Bank must be hit during Strobe Multi-ball to light an Extra Ball.

OFF: Do not light an Extra Ball from the Center Target Bank during Strobe Multi-ball.

08-12: Light an Extra Ball after hitting the Center Target Bank this number of times.

**A.2 09 Starting Attack Wave**

This adjustment is used to set the country in which the first Attack Wave will occur. This country is set for all players at the start of a new game, and randomized by the left and right slingshots.

RANDOM: Start the first Attack Wave in a random country.

FRANCE: Start the first Attack Wave in France.

GERMANY: Start the first Attack Wave in Germany.

ITALY: Start the first Attack Wave in Italy.

ENGLAND: Start the first Attack Wave in England.

U.S.A.: Start the first Attack Wave in the U.S.A.

**A.2 10 Attack Wave Start Difficulty**

This adjustment specifies the difficulty level of starting an Attack Wave. Attack Waves are started by completing the targets on the Motor Bank. When this adjustment is set to EASY, previously scored Motor Bank targets will be counted toward completing the bank to start an Attack Wave. When this adjustment is set to HARD, the three Motor Bank targets must be completed separately to start an Attack Wave.

EASY: Spot previously scored Motor Bank targets.

HARD: Do not spot previously scored Motor Bank targets.

**A.2 11 Attack Wave Difficulty**

This adjustment specifies the difficulty level of completing an Attack Wave. This adjustment affects the number of times the Saucer targets must be hit in order to qualify the Center Hole (behind the Drop Target) for destroying a Saucer.

EXTRA EASY:  $1 + (3 * N)$  per country.

EASY:  $2 + (3 * N)$  per country.

MEDIUM:  $3 + (3 * N)$  per country.

HARD:  $4 + (3 * N)$  per country.

EXTRA HARD:  $5 + (3 * N)$  per country.

(N = The number of Attack Waves completed).

**A.2 12 First Hard Lock**

This adjustment affects the difficulty of lighting Locks for Multi-ball. An "easy" lock requires one (1) shot up the Center Ramp to light all three (3) Locks. A "hard" lock requires one shot up the Center Ramp to light a single (1) Lock. This adjustment specifies the number of the Center Ramp shot that will result in a "hard" lock. The lower this number is, the harder it is to achieve Multi-ball.

01-03: The number of the Center Ramp shot that will result in a "hard" lock.

**A.2 13 Super Jackpot Timer**

This adjustment specifies the number of times that the Super Jackpot will move from shot to shot after Multi-ball has ended. The higher this number, the easier it is to collect the Super Jackpot after Multi-ball has ended.

05-20: The number of times the Super Jackpot will move from shot to shot after Multi-ball is over.

**A.2 14 Martian Target Memory**

This adjustment determines whether or not scored Martian Targets remain in memory from ball to ball.

YES: Scored Martian Targets remain in memory from ball to ball.

NO: Scored Martian Targets reset at the start of a new ball.

**A.2 15 Martian Attack Start Difficulty**

This adjustment determines the difficulty level for starting the Martian Attack feature. When set to EASY, the first Martian Attack can be started from the back of the Right Popper. When set to HARD, the Martian Attack feature can only be started from the front of the Right Popper.

EASY: The first Martian Attack can be started from the back of the Right Popper.

HARD: The Martian Attack feature must be started from the front of the Right Popper.

**A.2 16 Martian Attack Timer**

This adjustment specifies the number of seconds in which the player has to complete the Martian Attack feature.

10-60: The number of seconds in which the Martian Attack feature must be completed.

**A.2 17 Player Tournament Mode**

This adjustment allows players to simulate the Tournament Mode setting in the game (see A.1 26 for a description of Tournament Mode). If this adjustment is set to YES, and there are credits posted on the game, Tournament Mode may be enabled for the next game start by holding in both flipper buttons for approximately two (2) seconds and pressing the start button while the "Tournament Mode Ready" message is shown on the display.

YES: Allow access to the simulated Tournament Mode.

NO: Do NOT allow access to the simulated Tournament Mode.

**A.2 18 Family Mode**

This adjustment allows the game to operate in "Family Mode". Any possibly offensive or objectionable dot matrix images and sounds will not be utilized.

YES: Do NOT utilize any possibly offensive or objectionable dot matrix images and sounds.

NO: Utilize any possibly offensive or objectionable dot matrix images and sounds.

**A.2 19 Attract Mode Music**

This adjustment is used to allow the playing of music in Attract Mode.

YES: Allow music to be played in Attract Mode.

NO: Do NOT allow music to be played in Attract Mode.

**A.2 20 Attract Mode Sounds**

This adjustment is used to allow the playing of sound effects in Attract Mode.

- YES: Allow sounds effects to be played in Attract Mode.  
NO: Do NOT allow sound effects to be played in Attract Mode.

**A.2 21 Attract Mode Lights**

This adjustment allows the game to utilize the Flash Lamps and the Strobe Light in attract mode.

- YES: Utilize the Flash Lamps and the Strobe Light in Attract Mode.  
NO: Do NOT utilize the Flash Lamps and the Strobe Light in Attract Mode.

**A.2 22 Random Seed**

This adjustment is used to initialize the value of the random number generator.

0-65535: The value to use to initialize the random number generator.

**A.2 23 Novice Mode**

This adjustment is used to allow the player to select Novice Mode at the start of a game.

- OFF: Do NOT allow Novice Mode.  
1 MINUTE: Allow Novice Mode, and guarantee 1 minute of game time.  
1 1/2 MINUTES: Allow Novice Mode, and guarantee 1.5 minutes of game time.  
2 MINUTES: Allow Novice Mode, and guarantee 2 minutes of game time.  
2 1/2 MINUTES: Allow Novice Mode, and guarantee 2.5 minutes of game time.  
3 MINUTES: Allow Novice Mode, and guarantee 3 minutes of game time.

**A.2 24 Timed Plunger**

This adjustment specifies the number of seconds before automatically plunging a ball onto the playfield that can otherwise be plunged by the player via the launch button.

- OFF: Never automatically plunge a ball onto the playfield that can otherwise be plunged by the player via the launch button.  
30-90: The number of seconds before automatically plunging the ball.

**A.2 25 Flipper Plunger**

When this adjustment is set to YES, the right flipper will cause a ball sitting in the shooter lane to be launched onto the playfield. This adjustment is provided for use when the launch button is broken and/or intermittent. The game will automatically detect a broken launch button, but it may take several games to perform the detection. In this case, set this adjustment to YES until the launch button can be repaired.

- YES: Allow the right flipper to launch a ball sitting in the shooter lane.  
NO: Do NOT allow the right flipper to launch a ball sitting in the shooter lane.

**A.2 26 Disable Diverter**

This adjustment is provided for use when the diverter is broken and/or intermittent. The game will automatically detect a broken diverter, but it may take several games to perform the detection. In this case, set this adjustment to YES until the diverter can be repaired.

- NO: Do NOT disable the diverter.  
YES: Disable the Diverter.

**A.2 27 Disable Left Gate**

This adjustment is provided for use when the left gate is broken and/or intermittent. The game will automatically detect a broken left gate, but it may take several games to perform the detection. In this case, set this adjustment to YES until the left gate can be repaired.

NO: Do NOT disable the Left Gate.

YES: Disable the Left Gate.

**A.2 28 Disable Right Gate**

This adjustment is provided for use when the right gate is broken and/or intermittent. The game will automatically detect a broken right gate, but it may take several games to perform the detection. In this case, set this adjustment to YES until the right gate can be repaired.

NO: Do NOT disable the Right Gate.

YES: Disable the Right Gate.

**A.2 29 Disable Motor Bank**

This adjustment is provided for use when the motor bank is broken and/or intermittent. The game will automatically detect a broken motor bank, but it may take several games to perform the detection. In this case, set this adjustment to YES until the motor bank can be repaired.

If it is necessary to set this adjustment to YES, and the motor is operable, use T.18 (Motor Bank Test) to move the Motor Bank to either its UP or its DOWN position. This will minimize possible damage to the top of the unit during game play, and allow for maximum game play software compensation.

NO: Do NOT disable the Motor Bank.

YES: Disable the Motor Bank.

**A.2 30 Disable Drop Target**

This adjustment is provided for use when the drop target is broken and/or intermittent. The game will automatically detect a broken drop target, but it may take several games to perform the detection. In this case, set this adjustment to YES until the drop target can be repaired.

NO: Do NOT disable the Drop Target.

YES: Disable the Drop Target.

**A.2 31 Disable Aliens**

This adjustment is provided for use when the alien(s) are broken and/or intermittent. In this case, set this adjustment to YES until the alien(s) can be repaired.

NO: Do NOT disable the Aliens.

YES: Disable the Aliens.

**A.2 32 Disable Saucer**

This adjustment is provided for use when the saucer is broken and/or intermittent. In this case, set this adjustment to YES until the saucer can be repaired.

NO: Do NOT disable the Saucer.

YES: Disable the Saucer.

#### **A.2 33 Disable Strobe Light**

This adjustment is provided for use when the strobe light is broken and/or intermittent. In this case, set this adjustment to YES until the strobe can be repaired.

Note: If this adjustment is set to YES, the Strobe Multi-ball feature will NOT be available.

NO: Do NOT disable the Strobe Light.

YES: Disable the Strobe Light.

## A.3 Pricing Adjustments

### A.3 01 Game Pricing (if set to custom, then 02 to 09 are available).

The cost of a game is selected here, from the Standard Pricing Table or by using the Custom Pricing Editor (A.3 27).

### A.3 02 thru A.3 09 Not Used

### A.3 10 Coin Door Type (if set to custom, then 11 to 15, 20 and 25 are available)

This adjustment is used to preset adjustments 11 through 15, 20 and 25, based on standard coin doors (U.S.A., German, Etc.).

### A.3 11 Collection Text

The coin system used to display the Earning Audits.

### A.3 12 Left Slot Value

### A.3 13 Center Slot Value

### A.3 14 Right Slot Value

### A.3 15 4th Slot Value

These are the values for the coins for these respective coin slots. These values are used for determining collection totals. The corresponding adjustments A.3 28 (Left Slot Credit Value) through A.3 31 (4th Slot Credit Value) typically contain the same values and are used to determine the number of credits awarded for the coin slot. Whenever these values are changed, the new value is copied to the corresponding A.3 28 through A.3 31 adjustment. If a bonus is desired for a particular coin (such as 3 credits for dollar coin) then the corresponding A.3 28 through A.3 31 "Credit Value" adjustment should be modified to award the bonus. See "Bonus for Special Coin" section for more information.

### A.3 16 Maximum Credits

The maximum number of credits the game can accumulate, either through game play awards or coin purchases. The range of this setting is 5 through 99. Reaching the specified setting prevents the award of any credits. The factory default is 10.

### A.3 17 Free Play

The player can operate the game without a coin (free play) or with a coin.

NO - A coin is necessary for game play.  
YES - Game play is free; no coin required.

### A.3 18 Hide Coin Audits

The coin audits may, or may not be displayed.

YES - The coin audits are not displayed.  
NO - The coin audits are displayed.  
HIDE NAMES - The coin audit value is shown but not the audit name.

### A.3 19 Not Used

### A.3 20 Base Coin Size

This is the smallest unit of coin that may be used when creating a custom pricing mode using the Pricing Editor (A.3 27). For example, in the USA this is typically \$0.25. All pricing levels are then specified in 25 cent (or greater) increments.

### **A.3 21 Coin Meter Units**

It is possible to connect a coin meter to the knocker coil driver which will log all coins through all slots. This adjustment activates the use of the knocker driver for this purpose, and determines the value of each unit on the meter. For example, to show the total amount of money collected as "total quarters", set this adjustment to "0.25". To show the amount of money collected as "total dollars", set this adjustment to "1.00".

Setting this adjustment to anything other than Off establishes the coin unit for a meter attached to the knocker driver, and overrides use of the knocker during awards.

### **A.3 22 Dollar Bill Slot**

The system normally requires 150 microseconds between coin pulses. This is too long a delay for a fast-pulsing dollar bill validator. This adjustment may be used to tell the game that there is a fast pulsing dollar bill validator connected to one of the coin switches. The options are:

NONE	=	No validator connected.
LEFT	=	Validator connected to left slot.
CENTER	=	Validator connected to center slot.
RIGHT	=	Validator connected to right slot.
FOURTH	=	Validator connected to fourth slot.

### **A.3 23 Minimum Coin Milliseconds**

This is the minimum width required for coin pulses to be accepted as valid coins. This may be changed to prevent certain kinds of cheating.

### **A.3 25 Allow Hundredths**

This is used for a custom door specifier. If set to "YES", then the values for A.3 12-15 are specified in units and hundredths (such as dollars and quarters). If set to "NO", then all values are in units (such as Francs and Lire).

### **A.3 26 Credit Fraction**

This determines the smallest fraction used for credits. It must always be even to accommodate the extra ball buy-in option of 1/2 credit, and is typically 1/2 but may need to be a different value for modes requiring more coins per credit.

### **A.3 27 Pricing Editor**

This function is now used to enter information for a custom pricing mode. The adjustment A.3 26 (Credit Fraction) may need to be set before entering the Custom Pricing Editor. This specifies the smallest fraction available for partial credits.

Because of the availability of an extra ball (buy-in) for 1/2 credit, this value is always even (1/2, 1/4, 1/6 etc.). The typical setting for A.3 26 is 1/2 (such that there are only full credits and half credits) but you may need to use a different value for other pricing modes.

Please note that formerly, the coin values specified by custom coin door adjustments A.3 12-15 only affected audit totals that showed collection totals. In the 10/94 pricing system, these coin values are added up for each coin received and credits are awarded based on pricing levels being reached. The pricing editor described here allows you to set these levels, however, it may be necessary for you to set A.3 10 (Coin Door Type) to "CUSTOM" and then change A.3 11-15, 20 and 25 to reflect the value of the coins being used. This is usually NOT NECESSARY, but must be done BEFORE using the custom pricing editor when it is necessary.

Begin the custom pricing function by pressing the "Enter" button while A.3 27 "PRICING EDITOR" is showing on the display.

The pricing editor will now show the data for the currently selected pricing mode. If this is the 1st use of the pricing editor then this will show the last built-in pricing that was selected. Otherwise it will be the last custom mode created by this function. (Note that A.3 01 will display "Custom" any time a non-standard pricing has been used.)

Assuming that last mode installed was 1/\$0.50 2/\$0.75 3/\$1.00 the display will appear as follows:

Custom Pricing Editor		
1)	\$0.25	1/2 cred.
2)	\$0.50	1 cred.
3)	\$0.75	2 cred.
4)	\$1.00	3 cred.

Display View

The "\$0.25" field will be flashing. You may now use the test mode buttons to perform the following functions:

- Escape:* Undo any changes to the current field and move to the previous field.
- "-" (Down):* Make the current field lower.
- "+" (Up):* Make the current field higher.
- Enter:* Save any change to the current field and move to the next field. Note that there are two columns of fields. Price levels are in the left column and credit levels are in the right column. Pressing "Enter" will move from the left column to the right column before moving to the next line.
- Start:* Save the current custom price mode or start over.

By using the above functions, simply enumerate each pricing level and the number of credits that should be awarded at that level. Please note that you must specify each fractional level in the sequence.

Example:	1/\$0.50	2/\$1.00	4/\$1.50	6/\$2.00
	1)	\$0.25	1/2 cred.	
	2)	\$0.50	1 cred.	
	3)	\$0.75	1 1/2 cred.	
	4)	\$1.00	2 cred.	
	5)	\$1.25	2 1/2 cred.	
	6)	\$1.50	4 cred.	
	7)	\$1.75	4 1/2 cred.	
	8)	\$2.00	6 cred.	

Also note that once the value of the coins repeat that no further specification is necessary.

Example:	1/\$0.50	2/\$1.00	
	1)	\$0.25	1/2 cred.

In the above example, only one line needs to be specified, indicating that 1/2 credit is awarded for each \$0.25 received.

**Special Features:**

There are some special features available by pressing the “-” (Down) button while in the left column. The following words will be displayed instead of a pricing level:

*End*  
*Delete*  
*Insert*  
*Clear*  
*Repeat 1*  
*Repeat 2*  
*Repeat 3*  
*Repeat 4*  
*Repeat 5*  
*Repeat 6*  
*Repeat 7*  
*Repeat 8*  
*Repeat 9*  
*Repeat 10*  
*Repeat 11*  
*Repeat 12*  
*Repeat 13*  
*Repeat 14*  
*Repeat 15*  
*Repeat 16*  
*Repeat 17*  
*Repeat 18*  
*Repeat 19*  
*Repeat 20*

Pressing “Enter” with the above words selected will activate the following functions:

**End** This is the same as pressing the start button. A menu of choices will be provided (see “Start Button” below).

**Delete** This will delete the current level from the pricing mode.

**Insert** This will insert a new pricing level ABOVE the current level. The current level will be unaffected. There must be room for at least 1 coin between the current level and the previous level, and at least one fractional credit unit between the current level and the previous level.

Example: Inserting a new pricing level.

Custom Pricing Editor		
1)	\$0.50	1 cred.
2)	\$1.00	2 cred.
3)	\$1.50	4 cred.
4)	\$2.00	6 cred.

Display View

Use the “Enter” button to move to the \$1.50 field. Now press the “-” button once to create the following display:

Custom Pricing Editor		
1)	\$0.50	1 cred.
2)	\$1.00	2 cred.
3)	INSERT	4 cred.
4)	\$2.00	6 cred.

Display View

Now press the “Enter” button. The display will now show:

Custom Pricing Editor		
1)	\$0.50	1 cred.
2)	\$1.00	2 cred.
3)	\$1.25	2 1/2 cred.
4)	\$1.50	4 cred.

Display View

Note that the line “5) \$2.00 6 cred.” no longer fits on the display. Whenever there are more than 4 pricing levels the display will scroll up and down as “Enter” and “Escape” are used to move from field to field. If you repeatedly press “Enter” the display will then show:

Custom Pricing Editor		
2)	\$1.00	2 cred.
3)	\$1.25	2 1/2 cred.
4)	\$1.50	4 cred.
5)	\$2.00	6 cred.

Display View

**Clear** This will clear out the current entries to allow a new price mode to be entered.

**Repeat (1-20)** This will cause all entries above the current line to be repeated the number of times specified. This is only available when there are no pricing levels below the current line.

Example: 1/\$0.50      2/\$1.00      15/\$5.00

Use the “Edit New Pricing Mode” feature described below to clear out the current levels.

Use “+” and “Enter” to specify 1/2 credit for \$0.25:

Custom Pricing Editor		
1)	\$0.25	1/2 cred.

Display View

Now, use “-” until the display shows “Repeat 20”. The display will show the following:

Custom Pricing Editor		
1)	\$0.50	1 cred.
2)	REPEAT 20	

Display View

Press “Enter” and the display will show the following:

Custom Pricing Editor		
1)	\$0.25	1/2 cred.
2)	\$0.50	1 cred.
3)	\$0.75	1 1/2 cred.
4)	\$1.00	2 cred.

Display View

Actually, by repeating the 1st line 20 times the pricing mode is currently set up as follows, but only the 1st 4 lines are displayed.

Custom Pricing Editor		
1)	\$0.25	1/2 cred.
2)	\$0.50	1 cred.
3)	\$0.75	1 1/2 cred.
4)	\$1.00	2 cred.
5)	\$1.25	2 1/2 cred.
6)	\$1.50	3 cred.
7)	\$1.75	3 1/2 cred.
8)	\$2.00	4 cred.
9)	\$2.25	4 1/2 cred.
10)	\$2.50	5 cred.
11)	\$2.75	5 1/2 cred.
12)	\$3.00	6 cred.
13)	\$3.25	6 1/2 cred.
14)	\$3.50	7 cred.
15)	\$3.75	7 1/2 cred.
16)	\$4.00	8 cred.
17)	\$4.25	8 1/2 cred.
18)	\$4.50	9 cred.
19)	\$4.75	9 1/2 cred.
20)	\$5.00	10 cred.

Now, repeatedly press "Enter" to move to the right hand column of the 20th level. The display will show (with "10 cred." blinking):

Custom Pricing Editor		
17)	\$4.25	8 1/2 cred.
18)	\$4.50	9 cred.
19)	\$4.75	9 1/2 cred.
20)	\$5.00	10 cred.

Display View

Now, press "+" repeatedly until the right hand column of line 20) reads "15 cred."

**Start Button:** Once the pricing mode has been specified, exit the custom pricing editor by pressing the "Start" button. This will bring up a menu with (some or all of) the following choices:

Choose an Option:
Return to Editor
Clear Pricing
Ignore Changes
Save Changes

Display View

Use the "+" and "-" button to select your choice and press the "Enter" button to activate. The selections cause the following actions:

**Return to Editor:** This option will allow you to continue to edit the pricing information.

**Clear Pricing:** This option will clear out all pricing levels and bring you back to the pricing editor to create a pricing mode from scratch.

**Ignore Changes:** This option will discard the work done in the pricing editor and leave the previously installed pricing mode in the game.

**Save Changes:** Press "Enter" to save your custom edited pricing mode and install it as the pricing for the game. Note that this choice will not be displayed if there is not at least one pricing level specified in the pricing editor, or if no changes have been made.

**Exit Pricing Editor:** This option will appear if no changes have been made. It will exit the Pricing Editor leaving the pricing as is.

## Bonus for Special Coins

For most coin modes, the system allows the mixing of any combination of any size coin and awards credits as each appropriate amount is accumulated. With A.3 10 (Coin Door Type) set to "custom", the value of each coin slot may be entered for adjustments A.3 12 (Left slot value) through A.3 15 (4th slot value). Whenever these values are changed, the new values are copied to A.3 28 (Left Slot Credit Value) through A.3 31 (4th Slot Credit Value) respectively. To give a bonus for a particular coin, you need to modify the "Credit Value" adjustment to specify the value to be given for the bonus coin.

For example, in a game with a Left Coin Slot that takes quarters and a center coin slot that takes dollars, if you wish to charge 50 cents for 1 play and \$1.00 for 2 plays, you setup the pricing editor to show:

1)	\$0.25	1/2 Cred
2)	\$0.50	1 Cred
3)	\$0.75	1 1/2 Cred
4)	\$1.00	2 Cred

If you set A.3 10 (Coin Door Type) to "custom" you will see the following coin door specifier adjustments:

A.3 12	Left Slot Value	0.25
A.3 13	Center Slot Value	1.00
A.3 28	Left Slot Credit Value	0.25
A.3 29	Center Slot Credit Value	1.00

To change the pricing to 1 play for \$0.50, 2 plays for \$1.00 and 3 plays for a dollar coin, you change A.3 29 (Center Slot Credit Value) to 1.50. This will result in the following settings:

A.3 12	Left Slot Value	0.25
A.3 13	Center Slot Value	1.00
A.3 28	Left Slot Credit Value	0.25
A.3 29	Center Slot Credit Value	1.50

This will cause \$1.50 worth of credits (3) to be awarded for each coin inserted in the center coin slot (dollar coin). This is due to the \$1.50 setting of A.3 29 (Center Slot CREDIT VALUE). Note that the 1.00 setting of A.3 13 tells the game that each coin in the center slot adds \$1.00 to the total collection.

### **A.3 28 Left Slot Credit Value**

### **A.3 29 Center Slot Credit Value**

### **A.3 30 Right Slot Credit Value**

### **A.3 31 4th Slot Credit Value**

This adjustment specifies the value to be used for awarding credits. It is typically the same value as the corresponding A.2 12 (Left Slot Value) through A.2 15 (4th Slot Value) adjustment.

The A.3 12 through A.3 15 values are used to determine the auditing value of each coin (for collection totals) while the A.3 28 through A.3 31 value determine the coin value for awarding credits. By making this "Credit Value" adjustment higher than the A.3 12 through A.3 15 "Value" adjustment, a bonus may be given for a specific call (see "Bonus for Special Coin" section for more information).

### Pricing Table

Country	Coin Chutes				Games/Coins	Display	Pricing Adjustments A3														
	Left	Center	Right	4th Chute			02 03 04 05 06 07 08 09														
USA	25¢	\$1.00*	25¢	\$1.00	1/50¢, 2/75¢, 3/\$1 <sup>2</sup>	50¢, 75¢, \$1.00															
	25¢	\$1.00*	25¢	\$1.00	1/75¢, 2/\$1.50, 3/\$2.00 <sup>2</sup>	1/75, 3/2.00															
	25	\$1.00	25¢	\$1.00	1/3X25¢ <sup>2</sup>	USA1 1/\$0.75															
	25	\$1.00	25¢	\$1.00	1/50¢, 2/\$1 <sup>2</sup>	USA 2/\$1.00															
	25	\$1.00	25¢	\$1.00	1/50¢, 3/\$1.00 <sup>2</sup>	USA 3/\$1.00															
	25	\$1.00	25¢	\$1.00	1/2x25¢, 2/\$1.00, 3/\$1.50, 6/\$2.00 <sup>2</sup>	USA 6/\$2.00															
	25	\$1.00	25¢	\$1.00	1/2x25¢, 2/\$1.00, 3/\$1.50, 5/\$2.00 <sup>1,2</sup>	USA 5/\$2.00															
	25	\$1.00	25¢	\$1.00	1/3X25¢, 2/\$1.50, 4/\$2.00 <sup>2</sup>	1/75, 4/\$2.00															
	25¢	\$1.00	25¢	\$1.00	1/2x25¢, 2/\$1.00, 4/\$1.50, 6/\$2.00 <sup>2</sup>	6/\$2.00 4/\$1.50															
	25¢	25¢	25¢	-	1/4x25¢, 6/\$5.00 <sup>2</sup>	1/1, 6/5															
	25¢	25¢	25¢	-	1/4x25¢ <sup>2</sup>	1/\$1.00															
Canada	25¢	-	\$1.00*	-	1/50¢, 2/75¢, 3/\$1 <sup>2</sup>	CAN. 50-75-1															
	25¢	-	\$1.00	-	1/50¢, 2/\$1 <sup>2</sup>	CAN. 2/\$1.00															
	25¢	-	\$1.00	-	1/50¢, 2/\$1.00, 3/\$1.00 <sup>2</sup>	CAN. 3/\$1.00															
	25¢	-	\$1.00	-	1/2x25¢, 2/4x25¢, 3/\$1.00 <sup>2</sup>	3/\$1.00 Coin															
	25¢	-	\$1.00	-	1/2x25¢, 2/\$1.00, 3/\$1.50, 6/\$2.00 <sup>2</sup>	CAN. 6/\$2.00															
	25¢	-	\$1.00	-	1/2x25¢, 2/\$1.00, 3/\$1.50, 5/\$2.00 <sup>1,2</sup>	CAN. 5/\$2.00															
	25¢	-	\$1.00	-	1/2x25¢, 2/\$1.00, 4/\$1.50, 6/\$2.00 <sup>2</sup>	6/\$2.00 4/1.50															
	25¢	-	\$1.00	-	1/3X25¢, 2/\$1.50, 4/\$2.00 <sup>2</sup>	1/75, 4/2.00															
	25¢	-	\$1.00*	-	1/75¢, 2/\$1.00, 3/\$2.00 <sup>2</sup>	1/75, 3/2.00															
	25¢	-	\$1.00	-	1/3X25¢ <sup>2</sup>	CAN. 1/\$0.75															
Austria	5sch	10sch	10sch	-	1/2x5sch, 3/2x10sch <sup>2</sup>	AUSTRIA															
	5sch	-	10sch	-	2/5sch, 5/10sch	CUSTOM	02 00 05 00 01 00 01 00														
Australia	20¢	\$1	\$1	\$2	1/\$1, 3/\$2 <sup>2</sup>	AUSTRALIA 1															
	20¢	\$1	\$1	\$2	1/\$1, 2/\$2	AUSTRALIA 2															
U.K.	£1.00	50P	20P	10P	1/3x10P, 2/50P, 4/£1 <sup>2</sup>	U. KINGDOM															
Switzerland	1Fr	2Fr	5Fr	-	1/1Fr, 3/2Fr, 7/5Fr <sup>2</sup>	SWISS 1															
	1Fr	2Fr	5Fr	-	1/2Fr, 2/3Fr, 3/4Fr, 5/5F	SWISS 2															
	1Fr	2Fr	5Fr	-	1/1Fr, 5/5Fr	SWISS 3															
	1Fr	2Fr	5Fr	-	1/1Fr, 2/2Fr, 6/5Fr	SWISS 4															
	1Fr	1Fr	-	-	1/1Fr	SWISS 5															
Belgium	5Fr	20Fr	50Fr	-	1/4x5Fr, 1/20Fr, 3/50Fr <sup>2</sup>	BELGIUM 1															
	5Fr	20Fr	50Fr	-	1/20Fr, 3/60Fr, 3/50Fr	BELGIUM 2															
Germany	1DM	2DM	5DM	-	1/2DM, 2/3DM, 3/4DM, 4/5DM <sup>1,2</sup>	GER. 4/5DM															
					1/2DM, 2/3DM, 3/4DM, 5/5DM <sup>1,2</sup>	GER. 1/2DM															
					1/1DM, 2/2DM, 5/5DM <sup>2</sup>	GER. 1/1DM															
					1/1DM, 2/2DM, 6/5DM <sup>2</sup>	GER. 6/5DM															
Holland	1G	-	1G	-	1/1G <sup>2</sup>	HOLLAND															
Sweden	1Kr	5Kr	10Kr	1Kr	1/10Kr, 2/15Kr, 3/20Kr <sup>1,2</sup>	SWEDEN 1															
	1Kr	5Kr	10Kr	1Kr	1/5Kr <sup>2</sup>	SWEDEN 2															
France	1Fr	5Fr	10Fr	20Fr	1/3x1Fr, 2/5Fr, 5/10Fr, 10/20Fr <sup>2,3</sup>	TARIF 1															
	1Fr	5Fr	10Fr	20Fr	1/2x1Fr, 3/5Fr, 7/10Fr, 14/20Fr <sup>2,3</sup>	TARIF 2															
	1Fr	5Fr	10Fr	20Fr	1/5Fr, 3/10Fr, 7/2x10Fr, 7/20Fr <sup>1,2,3</sup>	TARIF 3															
	1Fr	5Fr	10Fr	20Fr	2/5Fr, 4/10Fr, 9/2x10Fr, 9/20Fr <sup>2,3</sup>	TARIF 4															
	1Fr	5Fr	10Fr	20Fr	2/5Fr, 5/10Fr, 11/2x10Fr, 11/20Fr <sup>2,3</sup>	TARIF 5															
	1Fr	5Fr	10Fr	20Fr	1/5Fr, 3/10Fr, 6/20Fr <sup>2,3</sup>	TARIF 6															
Italy	500L	500L	500L	-	1/500L <sup>2</sup>	ITALY 1															
	500L	500L	500L	-	1/2x500L, 3/4x500L <sup>1,2</sup>	ITALY 2															
	500L	500L	500L	-	1/2x500L, 2/4x500L <sup>2</sup>	ITALY 3															
Spain	100P	-	500P	-	1/100P, 6/500P <sup>2</sup>	SPAIN															
	25P	-	100P	-	1/25P, 5/100P	CUSTOM	01 00 04 00 01 04 01 00														
	25P	-	100P	-	1/25P, 4/100P	CUSTOM	01 00 04 00 01 00 01 00														
	25P	-	100P	-	1/2x25P, 2/100P	CUSTOM	01 00 04 00 02 00 01 00														
	25P	-	100P	-	1/2x25P, 3/100P	CUSTOM	03 00 12 00 04 00 01 06														
Japan	100¥	-	100¥	-	1/100¥ <sup>2</sup>	JAPAN															
Chile	Token	-	Token	-	1/1Token <sup>2</sup>	CHILE															
Denmark	1Kr	5Kr	10Kr	20Kr	1/2x1kr, 3/5kr, 7/10kr <sup>2</sup>	DENMARK 1															
	1Kr	5Kr	10Kr	20Kr	1/5kr, 3/10kr, 6/20kr <sup>1,2</sup>	DENMARK 2															
Finland	1Mka	-	5Mka	-	1/2x1Mka, 3/5Mka <sup>2</sup>	FINLAND 1															
	1Mka	-	5Mka	-	1/3x1Mka, 2/5Mka <sup>2</sup>	FINLAND 2															
New Zealand	\$1.00	-	\$2.00	-	1/\$1, 3/\$2 <sup>2</sup>	NEW ZEALAND 1															
	\$2.00	-	\$1.00	-	1/\$1, 3/\$2, (\$2-\$1 door)	NEW ZEALAND 2															
Norway	5Kr	-	10Kr	-	1/5Kr, 2/10Kr, 5/20Kr <sup>2</sup>	NORWAY															
Argentina	10¢	10¢	10¢	-	1/1 Token <sup>2</sup>	ARGENTINA															
Greece	10D	20D	50D	-	1/2x10D, 1/20D, 3/50D	GREECE															
Antilles	25¢	25¢	1G	-	1/25¢, 4/1G	ANTILLES															
Netherlands	1Hfl	2.5Hfl	2.5Hfl	-	1/1Hfl, 3/2.5Hfl	NETHERLANDS 1															
	1Hfl	2.5Hfl	2.5Hfl	-	1/1Hfl, 3/2.5Hfl, 3/2.5Hfl	NETHERLANDS 2															
Hungary	20 Old	20 New	50F	-	1/40F, 2/60F, 4/100F <sup>2</sup>	HUNGARY															

Note: 1. Factory Default. 2. Standard Setting - Change by pressing Enter button. 3. Other functions are also affected.

\* Only if Bill Acceptor and Center Coin Chute are available.

## **A.4 H.S.T.D. Adjustments**

### **A.4 01 Highest Scores**

The game maintains a record of the four highest scores achieved to date.

- |     |   |   |
|-----|---|---|
| OFF | - | No high scores are recorded, or displayed.                                      |
| ON  | - | The four highest scores are stored in memory and displayed in the Attract Mode. |

### **A.4 02 H.S.T.D. Award**

The award given for achieving the High Score To Date, or the Champion H.S.T.D: Credit or Ticket.

### **A.4 03 Champion H.S.T.D.**

The "Highest" High Score is displayed in the Attract Mode. This score is not cleared when "High Score Reset Every" occurs.

- |     |   |  |
|-----|---|--|
| ON  | - | The "Highest" High Score is retained in memory and is displayed. |
| OFF | - | The "Highest" High Score is not retained.                        |

### **A.4 04 Champion Credits**

The operator chooses the number of credits or tickets awarded for a Grand Champion Score.

Range: 00 - 10.

### **A.4 05 H.S.T.D. 1 Credits**

### **A.4 06 H.S.T.D. 2 Credits**

### **A.4 07 H.S.T.D. 3 Credits**

### **A.4 08 H.S.T.D. 4 Credits**

The number of credits or tickets to be awarded whenever a player exceeds the 1st, 2nd, 3rd, and 4th highest scores.

Range: 00 - 10.

### **A.4 09 High Score Reset Every**

The number of games to be played before an automatic reset of the displayed "Highest Score" occurs. The values provided upon reset are those selected by the operator in the Back-up High Scores.

Range: OFF (disabled); 250 to 20,000.

### **A.4 10 Backup Champion**

The Back-up Grand Champion Score.

Range: 00 - 9,500,000,000.

**A.4 11 Backup H.S.T.D. 1****A.4 12 Backup H.S.T.D. 2****A.4 13 Backup H.S.T.D. 3****A.4 14 Backup H.S.T.D. 4**

The first through the fourth Back-up High Score values. The game automatically restores this value when the High Score Reset Every value is reached.

Range: 00 - 9,500,000,000.

**A.4 15 Backup Buy-In H.S.T.D. 1****A.4 16 Backup Buy-In H.S.T.D. 2****A.4 17 Backup Buy-In H.S.T.D. 3****A.4 18 Backup Buy-In H.S.T.D. 4**

The first through the fourth Back-up Buy-In High Score values. The game automatically restores these values when the High Score Reset Every value is reached. **Note:** These adjustments are shown when "A.2 01 Buy Extra Ball" is set to  $\frac{1}{2}$  Credit or 1 Credit.

Range: 00 to 9,500,000,000

**A.4 19 Alien Champion**

This adjustment is used to set the number of Aliens that must be destroyed in a game to become the new Alien Champion.

Range: 5 to 50

**A.4 20 Alien Champion Credits**

This adjustment specifies the number of credits to award for a new Alien Champion.

Range: 00 to 03

## ERROR MESSAGES

The WPC game program has the capability to aid the operator and service personnel. At game turn-on, or after pressing the Begin Test switch, once the game has been operating for an extended period, the display may signal with a message, "Press ENTER for Test Report". This indicates the game program has detected a possible problem with the game.

To obtain details of the problem open the coin door and press the Begin Test switch. Press the Enter button to begin displaying the message(s). The following messages apply to your game.

**Check Diverter - Stuck Closed.**

The game has detected that the Diverter is stuck closed. Check the Diverter Power coil and the Diverter Hold coil in Coil Test, and verify that the Diverter is not sticking when moved manually. This error message will be cleared in game play when the game detects four (4) consecutive successful shots to the correct side of the Diverter.

**Check Diverter - Stuck Open.**

The game has detected that the Diverter is stuck open. Verify that the Diverter is not sticking when moved manually. If the Diverter appears to be functioning properly, check the Left Popper Optical Switch for spurious behavior. This error message will be cleared in game play when the game detects four (4) consecutive successful shots to the correct side of the Diverter.

**Check Motor Bank - Down Switch Broken.**

The game has detected that the Motor Bank Down Switch is broken. Use T.19 (Motor Bank Test) to verify proper operation of the Motor Bank. Adjust the switch as necessary. The Motor Bank Down Switch should be CLOSED when the Motor Bank is all the way DOWN (flush with the playfield), and OPEN otherwise. When the Motor Bank Test detects three (3) consecutive successful openings of the Motor Bank, the test will clear this error (the bottom line of the display for the test will reflect this when it happens).

**Check Motor Bank - Up Switch Broken.**

The game has detected that the Motor Bank Up Switch is broken. Use T.19 (Motor Bank Test) to verify proper operation of the Motor Bank. Adjust the switch as necessary. The Motor Bank Up Switch should be CLOSED when the Motor Bank is all the way UP, and OPEN otherwise. When the Motor Bank Test detects three (3) consecutive successful closings of the Motor Bank, the test will clear this error (the bottom line of the display for the test will reflect this when it happens).

**Check Drop Target - Stuck Closed.**

The game has detected that the Drop Target Switch is Stuck Closed. Use T.18 (Drop Target Test) to verify proper operation of the Drop Target. The Drop Target Switch should be CLOSED when the Drop Target is DOWN, and OPEN when the Drop Target is UP. When the Drop Target Test detects three (3) consecutive successful attempts at raising the Drop Target, the test will clear this error (the bottom line of the display for the test will reflect this when it happens).

**Check Left Gate - Stuck Closed.**

The game has detected that the Left Gate is stuck closed. Check the Left Gate coil in Coil Test, and check the spring attached to the Left Gate behind the back panel. Verify that the Left Gate is not sticking or making contact with anything when moved manually. Then use T.16 (Loop/Gate Test) to verify proper operation of the Left Gate. When the Loop/Gate Test detects one (1) successful attempt at rolling a ball around the right loop, the test will clear this error.

**Check Left Gate - Stuck Open.**

The game has detected that the Left Gate is stuck open. Check the spring attached to the Left Gate behind the back panel. Verify that the Left Gate is not sticking or making contact with anything when moved manually. This error message will be cleared in game play when the game detects one (1) successful shot up the Right Loop that is delivered to the Top Rollover Lanes when the state of the game dictates that the Left Gate should be closed.

**Check Right Gate - Stuck Closed.**

The game has detected that the Right Gate is stuck closed. Check the Right Gate coil in Coil Test, and check the spring attached to the Right Gate behind the back panel. Verify that the Right Gate is not sticking or making contact with anything when moved manually. Then use T.16 (Loop/Gate Test) to verify proper operation of the Right Gate. When the Loop/Gate Test detects one (1) successful attempt at rolling a ball around the left loop, the test will clear this error.

**Check Right Gate - Stuck Open.**

The game has detected that the Right Gate is stuck open. Check the spring attached to the Right Gate behind the back panel. Verify that the Right Gate is not sticking or making contact with anything when moved manually. This error message will be cleared in game play when the game detects one (1) successful shot up the Left Loop that is delivered to the Top Rollover Lanes when the state of the game dictates that the Right Gate should be closed.

**Check Switch ##.**

This message indicates that at least one switch was stuck 'On' at game turn-on or has NOT been actuated during ball play (for 60 balls or approximately 20 games). The game program compensates the game play requirements affected by each disabled switch to allow 'nearly normal' play. This helps keep your game earning, until the service technician can repair the problem. To verify the problem, refer to the Test Menu text describing Switch Testing, and check each reported switch using applicable switch tests. Always check switch operation using a ball, to simulate game conditions. Switch problems may often be resolved by adjusting the wire switch actuators, fixing switch circuitry problems, securing loose connectors, etc. Mechanisms using 'opto switches' (ball poppers, etc.) need to be checked for proper power connections (+12V dc and ground).

**Check Fuses F101 and F106 and Opto 12V Supply**

This message will be displayed if the game senses that all optical switches are not functioning. This usually occurs when there is no 12V supply to the playfield optics.

The problem is likely to be a blown fuse (F109), or at connectors J138, J139, J140 or J141 on the power driver board.

**Opto Trough Bad Check Connectors, Wires and 12V Supply.**

This message will be displayed if all of the optics in the playfield ball trough are not functioning. This is usually caused by a problem with a ball trough connector supplying 12V and ground for the optical circuits.

**Pinball Missing.**

This game normally uses four balls, however, it will operate with less. This message announces that a ball is missing or stuck. When the ball is located, return it to the Ball Trough. Other possibilities for this problem could be malfunctions of the Ball Trough switches or the Ball Shooter switch.

**xxxxx Sw. is Stuck On.**

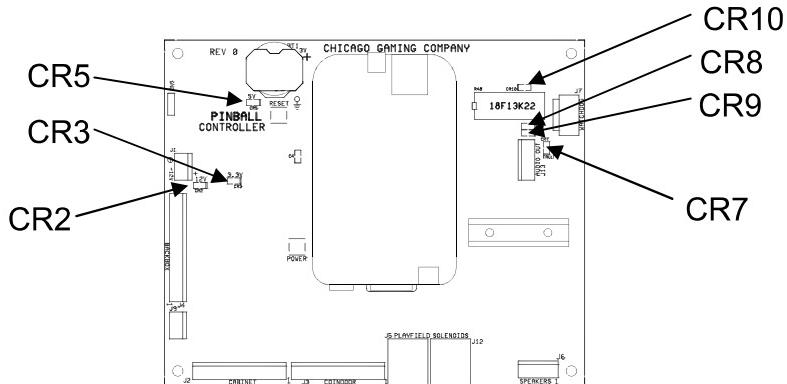
This message indicates that a switch, which is not usually On, remains in the On position after the game is switched On. The stuck switch is essential for game play (for example, a coin chute switch, the slam tilt switch, the plumb bob tilt switch), and should be cleared to permit proper game operation.

# Attack from Mars

## LED List

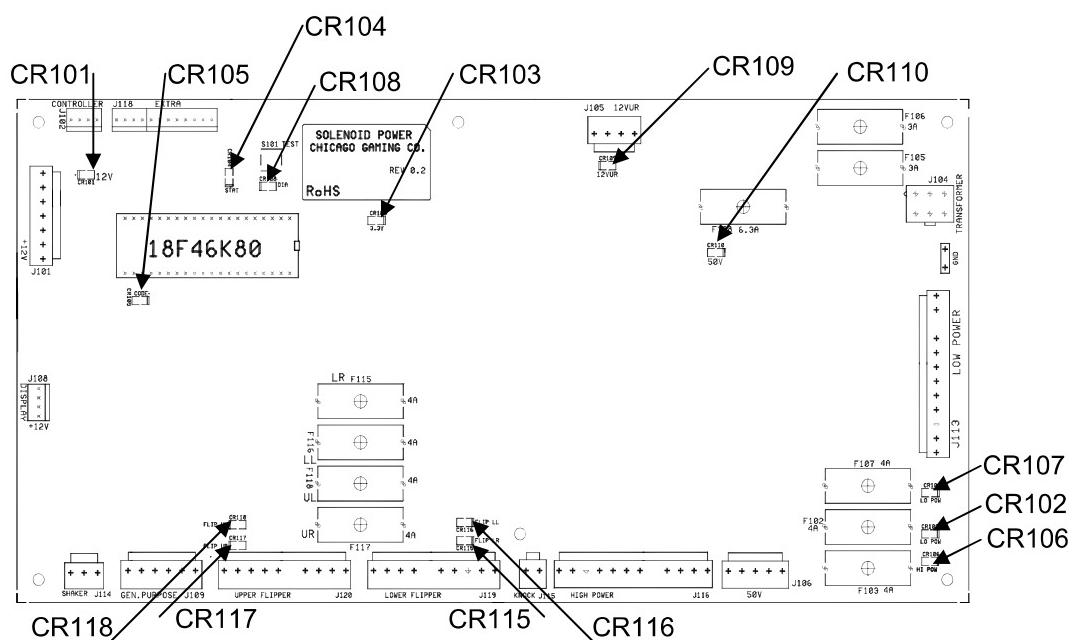
### Controller Board

**CR2:** 12V, normally on  
**CR3:** 3.3V, normally on  
**CR5:** 5V, normally on  
**CR7:** Amp Fault, normally off  
**CR8:** Heartbeat, flashes normally  
**CR9:** Blank, normally off. Yellow ON indicates blank is active.  
**CR10:** Reset, normally off.  
 Flashes red on boot and when watchdog hits reset.



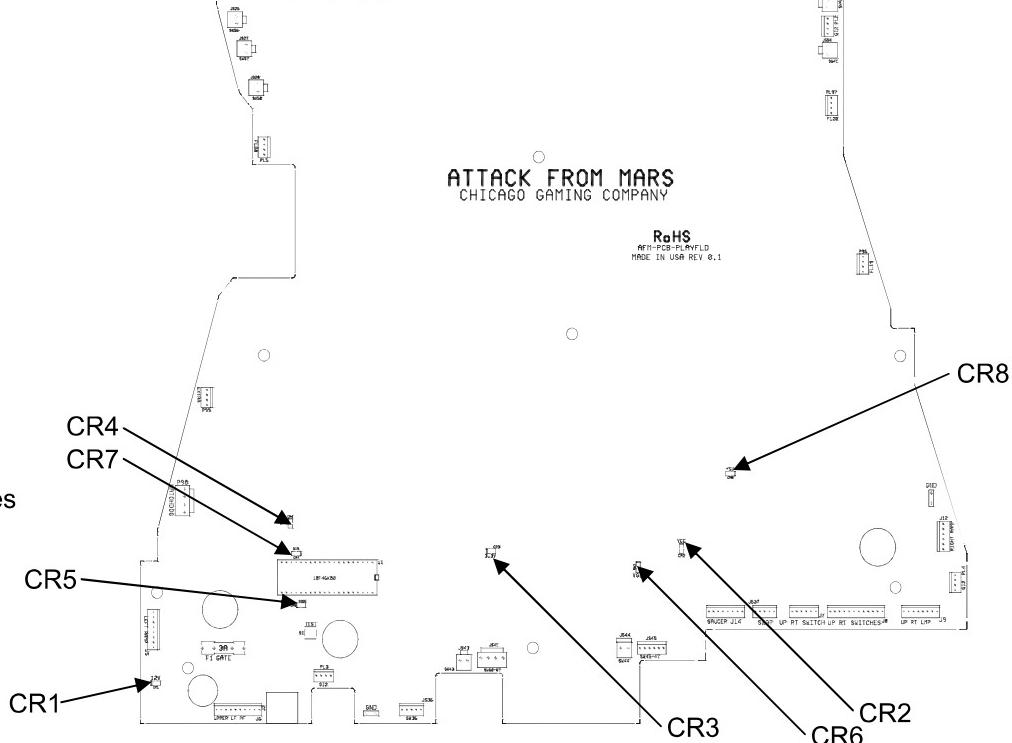
### Solenoid Power Board

**CR101:** 12V, normally on  
**CR102:** Fuse F102  
**CR103:** 3.3V, normally on  
**CR104:** STAT, off during boot, normally flashes when game is running  
**CR105:** CODE, flashes during boot, normally on.  
**CR106:** Fuse F103  
**CR107:** Fuse F107  
**CR108:** DIA, normally flashes  
**CR109:** 12VUR,  
**CR110:** 50V, normally on  
**CR115:** Fuse F115  
**CR116:** Fuse F116  
**CR117:** Fuse F117  
**CR118:** Fuse F118



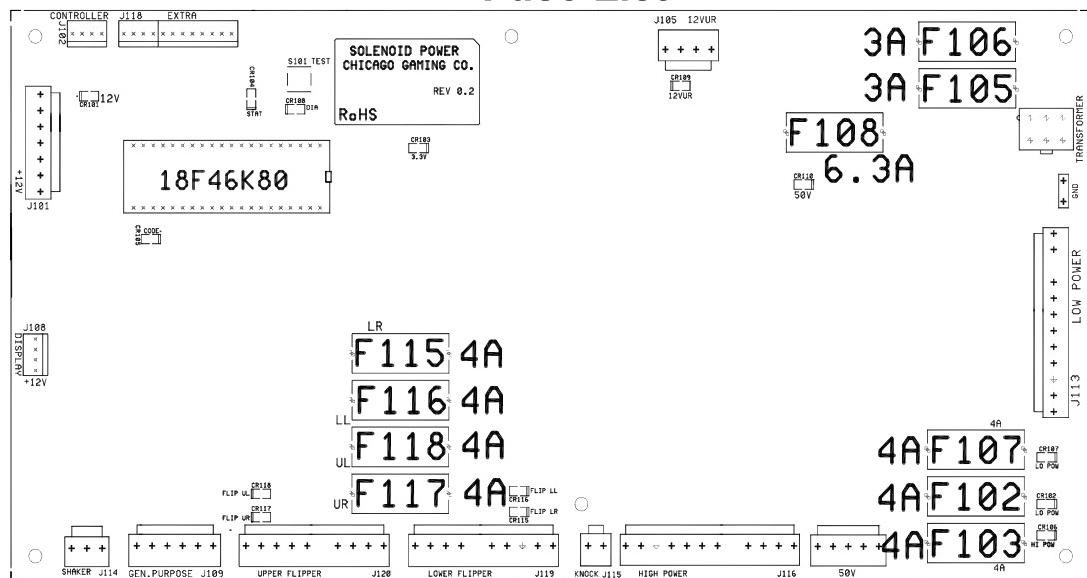
### Playfield Board

**CR1:** 12V, normally on  
**CR2:** VCC, normally on  
**CR3:** 3.3V, normally on  
**CR4:** STAT, off during boot, normally flashes when game is running  
**CR5:** CODE, normally on  
**CR6:** VGI, normally on  
**CR7:** DIA, normally flashes  
**CR8:** +5V, normally on



# Attack from Mars

## Fuse List



**ATTACK FROM MARS**  
CHICAGO GAMING COMPANY

RoHS  
ANTI-POLLUTANT  
MADE IN USA REV 0.2

### Power Interface Assembly (not shown)

LOC.	DESC.	PART NUMBER	VALUE
Panel Mount	AC Input	5ST 5-R	5A 250V Slow Blow

### Solenoid Power Board

LOC.	DESC.	PART NUMBER	VALUE
F108	50VAC	5ST 6.3R	6.3A 250V Slow Blow
F105	12VAC	5ST 3-R	3A 250V Slow Blow
F106	12VAC	5ST 3-R	3A 250V Slow Blow
F102	+50V Low Power Solenoids	5ST 4-R	4A 250V Slow Blow
F107	+50V Low Power Solenoids	5ST 4-R	4A 250V Slow Blow
F103	+50V High Power Solenoids	5ST 4-R	4A 250V Slow Blow
F115	+4A Lower Flipper Left	5ST 4-R	4A 250V Slow Blow
F116	+4A Lower Flipper Right	5ST 4-R	4A 250V Slow Blow
F117	+4A (Upper Flipper) Diverter	5ST 4-R	4A 250V Slow Blow
F118	+4A (Upper Flipper) NU	5ST 4-R	4A 250V Slow Blow

### Playfield Board

LOC.	DESC.	PART NUMBER	VALUE
F1 GATE	12V Ball Gates	5ST 3-R	3A 250V Slow Blow

## MAINTENANCE INFORMATION

### LUBRICATION

The two main lubrication points of the Ball Eject mechanism\* are the pivots for the arm. The mechanisms of other playfield devices are somewhat similar and have the same lubrication requirements. A medium viscosity oil (switch target grease) is satisfactory for these devices. Also, regularly lubricate the slide-mechanism rails and the leg levers.

Because of the functional design (arm-actuated via solenoid plunger operation), the pivot points of the Left and Right Kickers ("Slingshots") all require lubrication as a regular servicing procedure.

Lubrication to ensure proper operation also applies to the target blades of Drop Targets. MBI Instrument Grease, also known as Drop Target Switch Lubricant, (Bally part number of EI 165), is a recommended lubricant.

### SWITCH CONTACTS

#### Playfield Switches

For proper game operation, switch contacts should be free of dust, dirt, contamination, and corrosion. Blade switch contacts are plated to resist corrosion. Cleaning blade switch contacts requires gentle closing of the contacts on a clean business card or piece of paper, and then pulling the paper about 2 inches, which should restore the clean contact surface. Adjust the switch contacts to a 1/16-inch gap.

#### Flipper Switches

The end-of-stroke switches are NORMALLY OPEN and should close when the flipper is energized. All end-of-stroke switches are gold flashed computer grade leaf switches. Only low computer current is carried through these switches. DO NOT FILE or abrasively clean these switches! DO NOT REPLACE these switches with the old style tungsten high current type switches, as intermittent operation could occur. Please note that unlike the old style of flipper, an end-of-stroke switch failure will not harm the flipper. The game will notify the operator of a misadjusted switch in the test report, but will continue to play. The end-of-stroke switches are a means by which the new electronic flippers feel and play with all of the subtleties of the old flippers.

### CLEANING

Good game action and extended playfield life are the results of regular playfield cleaning. During each collection stop, the playfield glass should be removed and thoroughly cleaned and the playfield should be wiped off with a clean, lint-free cloth. The game balls should be cleaned and inspected for any chips, nicks, or pits. Replace any damaged balls to prevent playfield damage.

Regular, more extensive, playfield cleaning is recommended. However, avoid excessive use of water and caustic or abrasive cleaners because they tend to damage the playfield surface. Playfield wax (or any carnauba based wax), or polish may be used sparingly, to prevent a buildup on the playfield surface. Do not use cleaners containing petroleum distillates on any playfield plastics because they may dissolve the plastic material or damage the artwork.

\*May not be used on all games.

# **ATTACK FROM MARS™**

## **Unit Disassembly for Repair**

Major Component Service Instructions

# **Flying Saucer Mechanism**

## **A. To access saucer coil.**

1. Remove the two mounting screws (p/n FSM-083-HFH100C) that attach the Flying Saucer Assembly (p/n AFM-SUB-A20608) and Playfield Plastic Assembly #5 (AFM-A-207715) to the Back Panel Assembly (AFM-SUB-A20578). (See Fig.1)

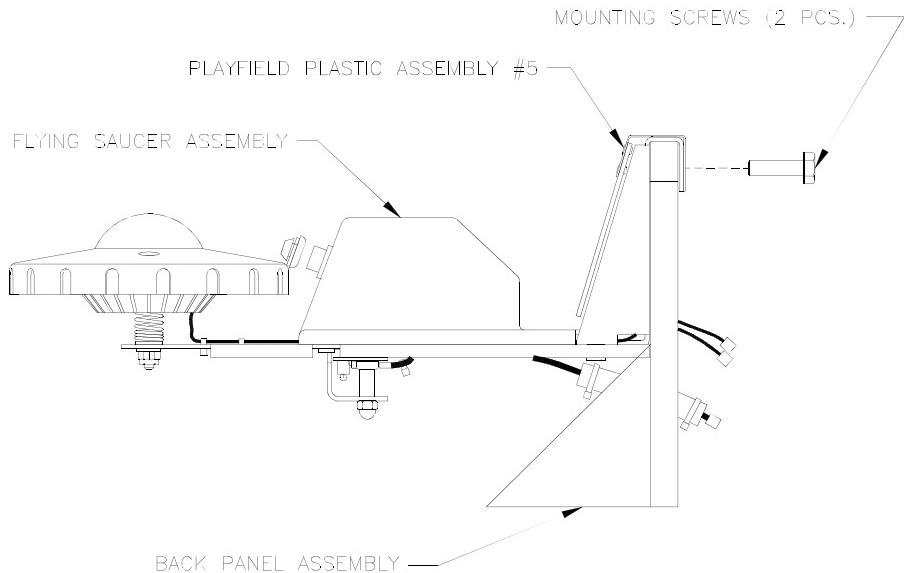


FIGURE 1

2. Place Playfield Plastic Assembly #5 to the side and remove the four mounting screws (p/n FSM-083-PSM031C) that mount the COIL COVER ASSEMBLY (p/n A-20870) to the Saucer Support Weldment (p/n 04-10315.1). You may now access and/or service the Saucer Coil Assembly (p/n PIN-AE-261500), the saucer Armature (p/n AFM-04-10361) or the Saucer Cables (p/n AFM-CBL-SUCRCBL & AFM-CBL-SACRSHK). (See Fig.2 & 3)

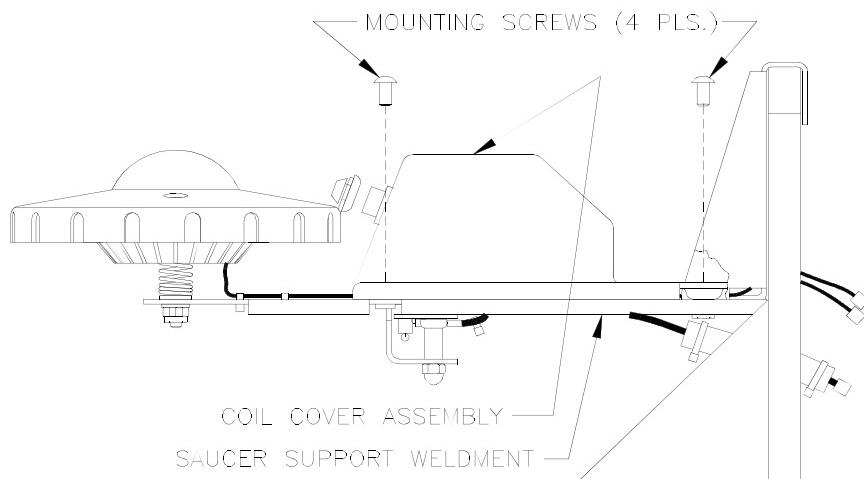


FIGURE 2

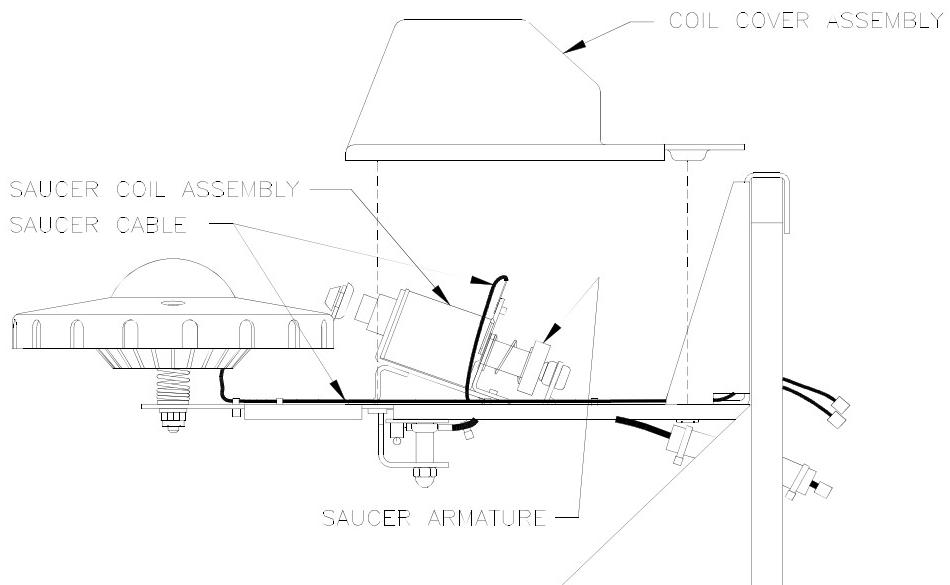


FIGURE 3

**B. To access internal saucer parts.**

1. Remove the entire saucer assembly (p/n AFM-SUB-A20608) from the Back Panel Assembly (p/n AFM-SUB-A20578) after unplugging it from the Playfield Saucer Cable (p/n AFM-CBL-PLFSUCR).
2. Remove the two plastic mounting screws (p/n FSM-083-PPH037N) from the Saucer Top (p/n AFM-03-94671M for metalized or AFM-03-94671 for original). (See Fig.4)
3. Carefully lift the Saucer Top straight up and set aside. (See Fig.5)

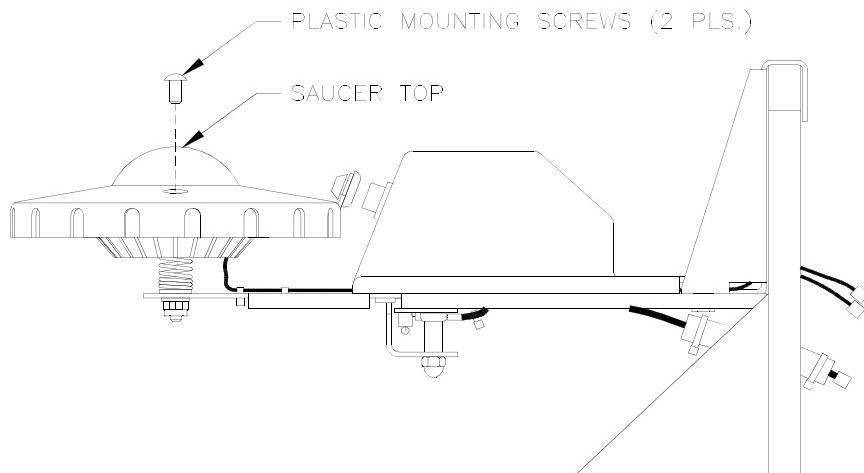


FIGURE 4

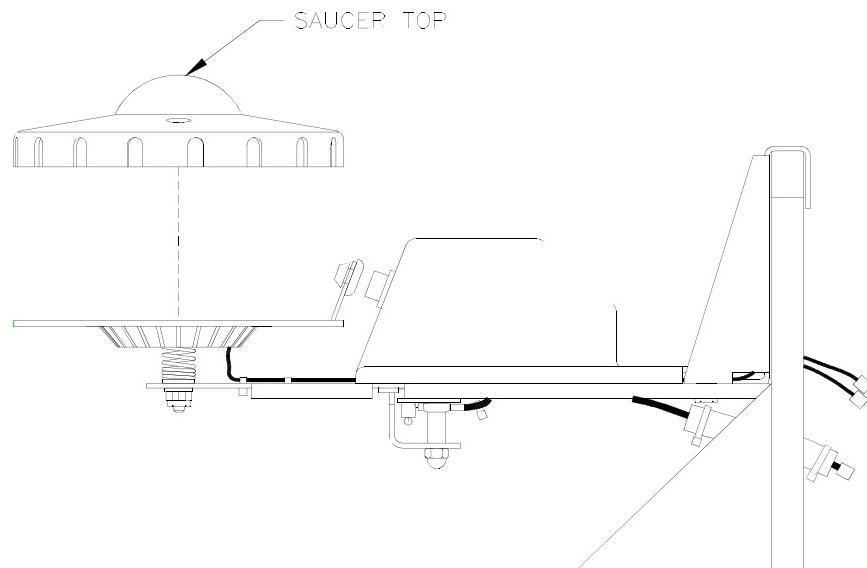


FIGURE 5

4. Carefully unplug the Saucer Cable (p/n AFM-CBL-SUCRCBL) from the L.E.D. Chase Light PCB (p/n AFM-PCB-SAUCR16) and push the cable out of the Saucer Body Assembly through the rectangular accesshole in the bottom of the Saucer Body Assembly. (See Fig.6)

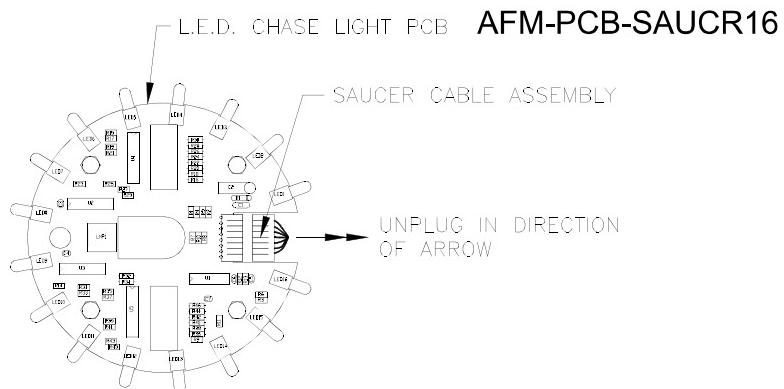


FIGURE 6  
(TOP VIEW OF SAUCER)

5. To remove the L.E.D. Chase Light PCB (p/n AFM-PCB-SAUCR16) and the Saucer PCB Insulator (p/n AFM-01-14210), remove the four PCB mounting screws (p/n FSM-083-HHS037C). (See Fig.7)  
The PCB and PCB Insulator may now be lifted straight up off of the Main Saucer Bracket (p/n AFM-04-103191). (See Fig.8)

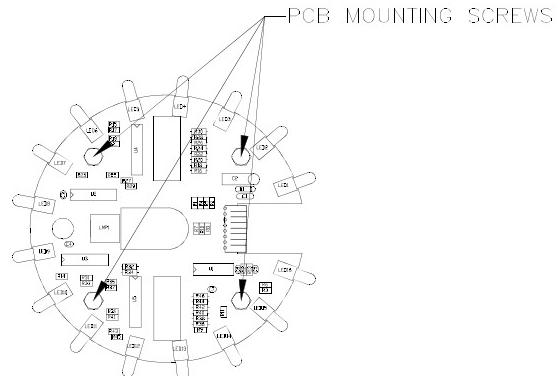


FIGURE 7  
(TOP VIEW OF SAUCER)

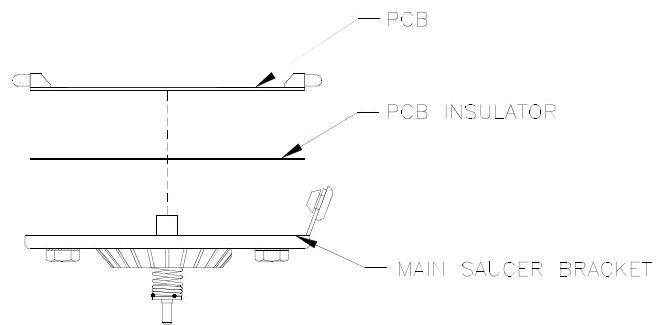


FIGURE 8

### C. Removing Saucer Body Assembly

1. To remove the entire Saucer Body Assembly (p/n AFM-A-20713) from the Main Saucer Assembly (p/n AFM-SUB-A20608), remove the nut (p/n FNT-083-ESNA000) and washer (p/n FWF-172-047059C) from the underside of the Main Saucer Assembly. (See Fig.9 & 10)
2. To re-install, reverse procedure stated in step 1, being certain that the flats on the bottom of the saucer spring are aligned with the flats in the cutout of the Main Saucer Assembly.

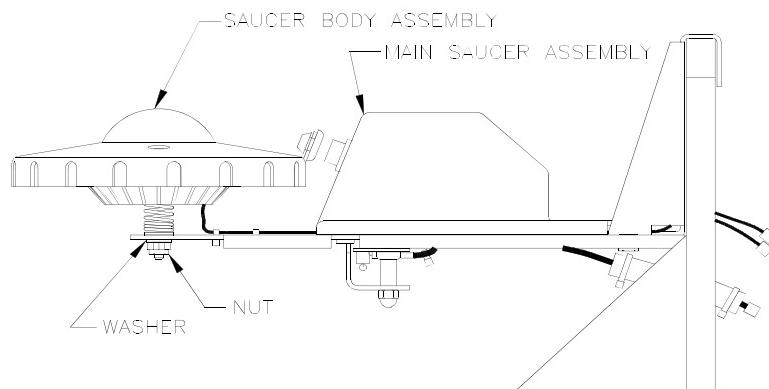


FIGURE 9

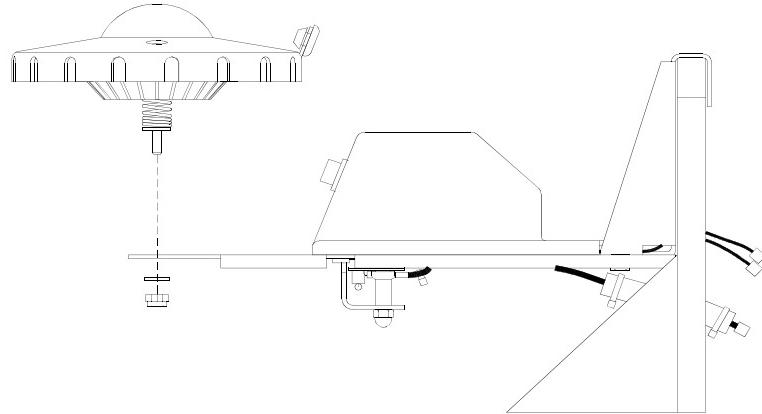


FIGURE 10

#### D. To Access Strobe PCB

1. Remove the two nylon lock nuts (p/n FSM-083-ESNA000) from the underside of Saucer Assembly (p/n AFM-SUB-A20608) (See Fig.11)

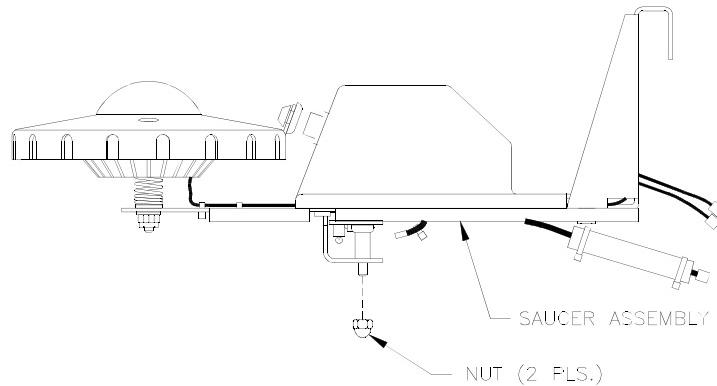


FIGURE 11

2. Slide Strobe Light Cover (p/n AFM-03-94783) and 45 degree Plastic Spacers (p/n AFM-HDW-SPCR45) off of the mounting studs. (See Fig.12)

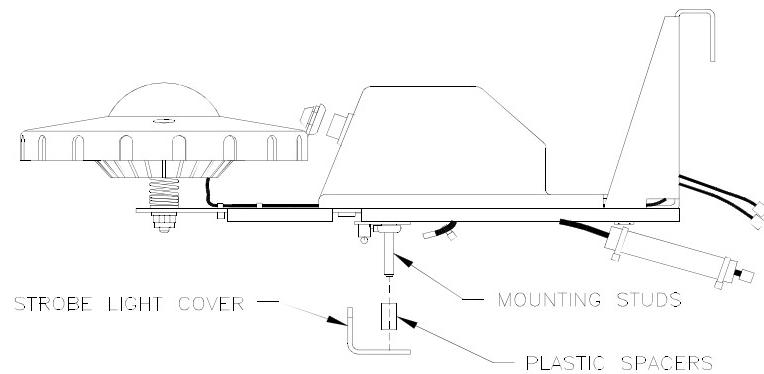


FIGURE 12

3. Remove the Strobe PCB from the mounting studs, collecting two more 45 degree spacers (p/n AFM-HDW-SPCR45). (See Fig.13)

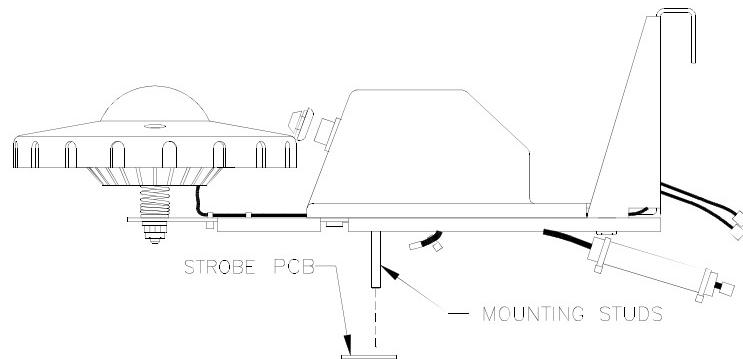


FIGURE 13

4. Unsolder the Saucer Cable (p/n AFM-CBL-SUCRCBL) from the Strobe PCB (p/n AFM-PCB-STROBE) (See Fig.14)

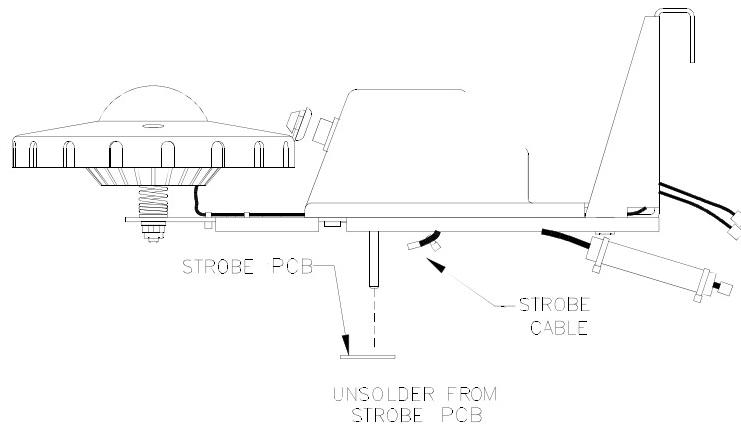


FIGURE 14

## NOTES

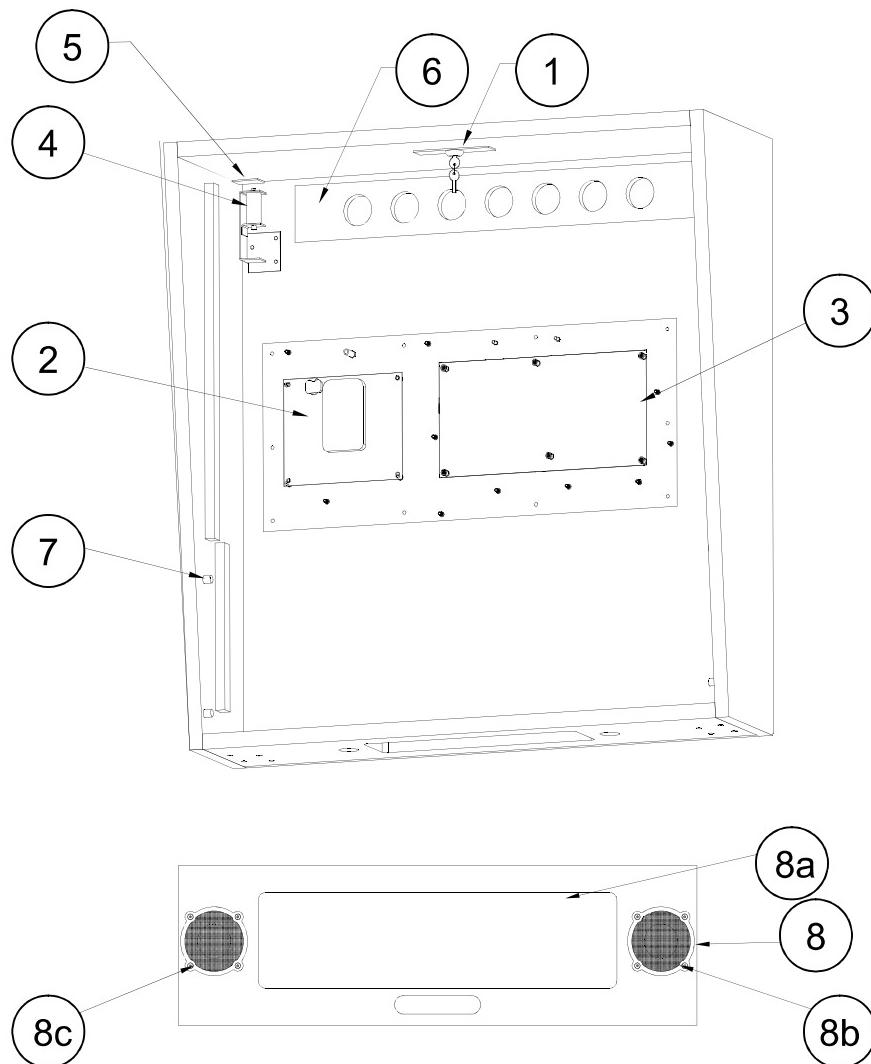
## NOTES

# **SECTION TWO**

**GAME PARTS  
INFORMATION**

# AFM-SUB-50041BB

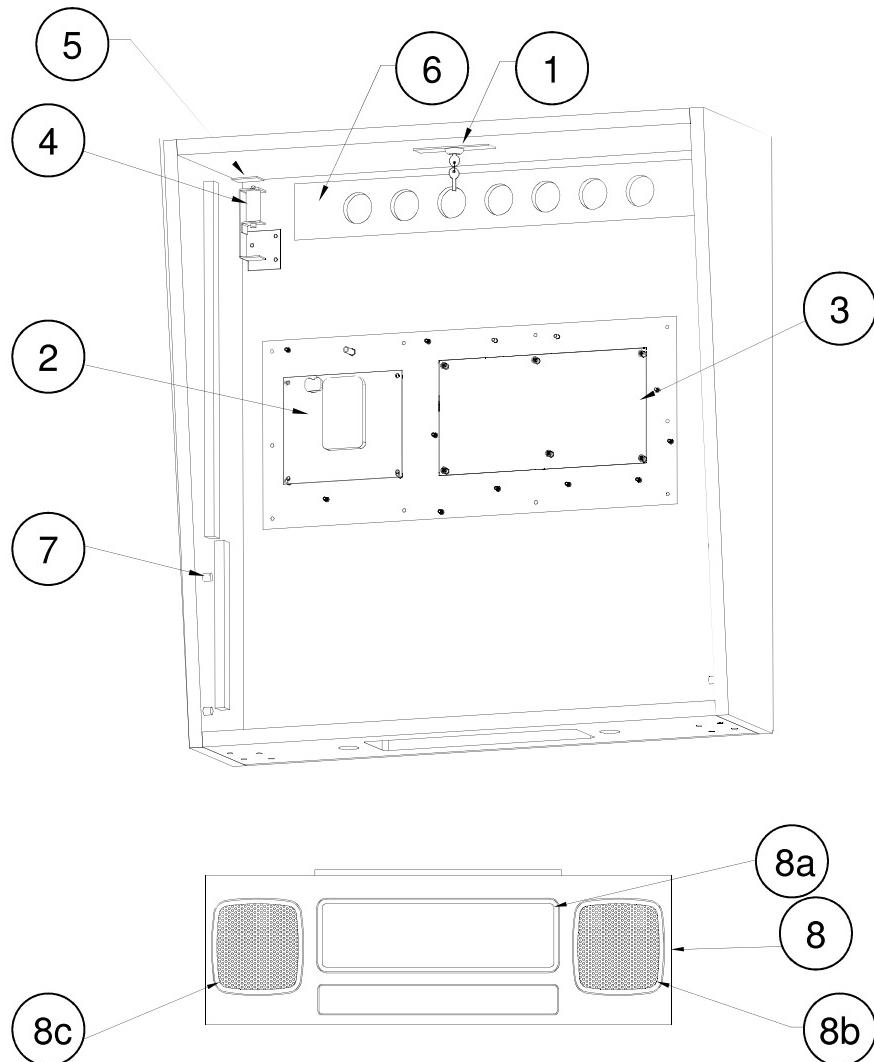
## Limited and Special Edition Backbox Assembly



Item	Part Number	Description	Miscellaneous Parts: (Not Shown)	
1	A-13379	Lock & Plate Assembly		
a)	20-9637	Lock & Cam Kit		
2	AFM-SUB-CONTRLR	AFM Controller Board		
3	PIN-PCB-SOLPOWR	Solenoid Power Board	08-7456	Backbox Glass, 27" x 18-7/8"
4	B-10686-1	Knocker Assembly	AFM-ART-BACKBOX	AFM Backbox Marquee Translite
5	01-7525	Knocker Plate		
6	01-6645	Vent Screen		
7	02-5223	Bushing Button, Speaker Panel		
8	PIN-SUB-XLCDDIS	XL LCD Display Assembly		
a)	PIN-MON-GSD198C	GSD 19.8" Cut LCD Panel		
b)	000-SPK-PLG3.2	Pyle PLG3.2, 3.5" 4 Ohm Speaker		
c)	000-SPK-PLG3.2	Pyle PLG3.2, 3.5" 4 Ohm Speaker		

# AFM-SUB-50041BB

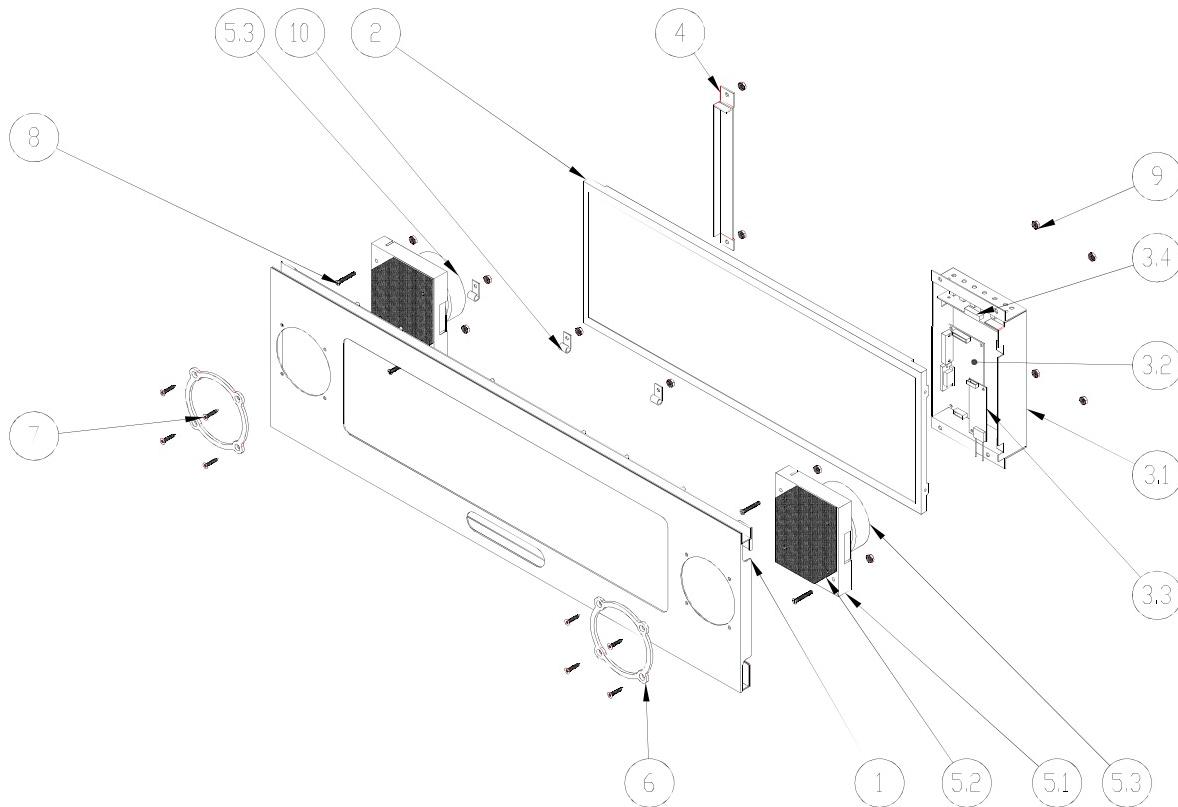
## Classic Edition Backbox Assembly



Item	Part Number	Description	Miscellaneous Parts: (Not Shown)	
1	A-13379	Lock & Plate Assembly		
a)	20-9637	Lock & Cam Kit		
2	AFM-SUB-CONTRLR	AFM Controller Board		
3	PIN-PCB-SOLPOWR	Solenoid Power Board	08-7456	Backbox Glass, 27" x 18-7/8"
4	B-10686-1	Knocker Assembly	AFM-ART-BACKBOX	AFM Backbox Marquee Translite
5	01-7525	Knocker Plate		
6	01-6645	Vent Screen		
7	02-5223	Bushing Button, Speaker Panel		
8	AFM-SUB-A20796	XL LCD Display Assembly		
a)	000-MON-156LCD	AUO 15.6 LCD Panel		
b)	PIN-SPK-5412PX	5.25" 4 Ohm Speaker		
c)	PIN-SPK-5412PX	5.25" 4 Ohm Speaker		

## PIN-SUB-XLCDDIS

### XL LCD Speaker Panel Assembly

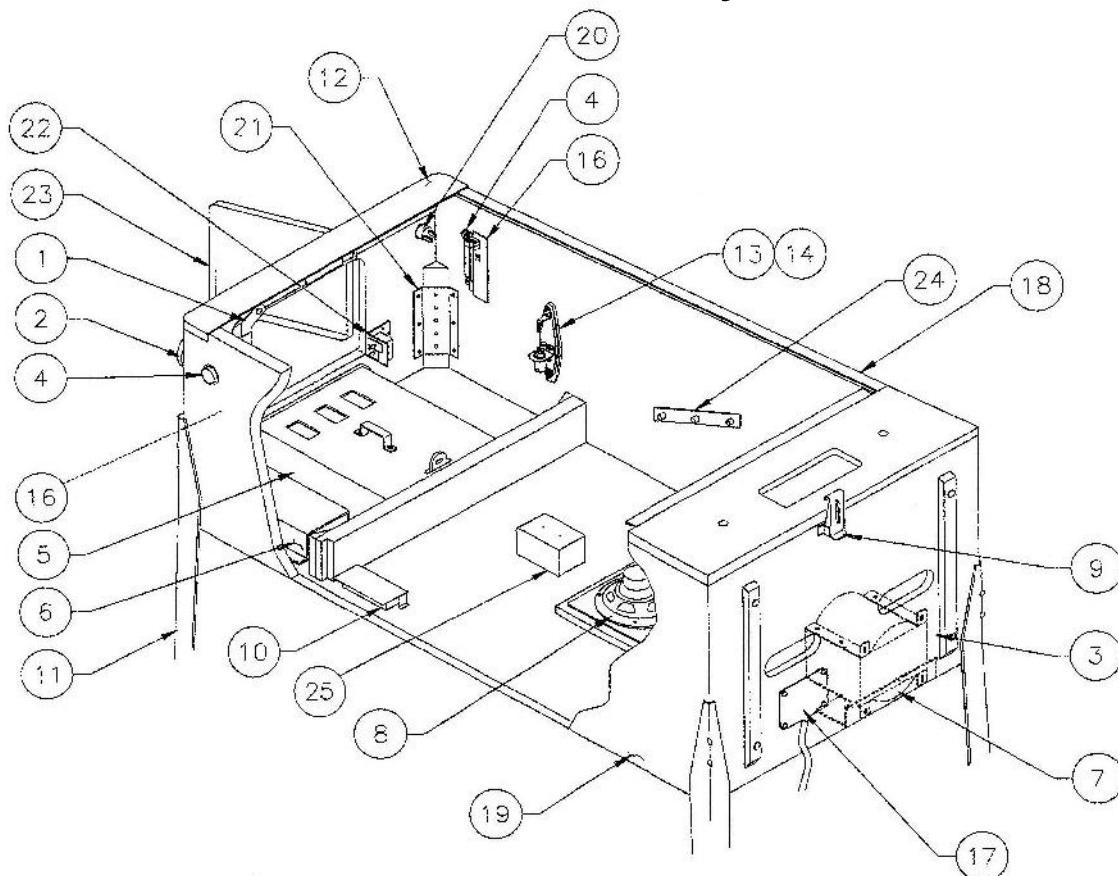


PLEASE NOTE: CABLE & HARNESS NOT SHOWN FOR CLARITY

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	PIN-MLS-XLCDFRM	XL Pinball Display Frame Back	1
2	PIN-MON-GSD198C	GSD 19.8" Cut LCD Display	1
3.1	PIN-MLS-XLCDBOK	XL Pinball Display - Electronics	1
3.2	PIN-PCB-LEDCN19	LCD Controller PCB w/Firmware	1
3.3	PIN-PCB-XLCDPWR	XL Pinball LCD Power Board	1
3.4	000-PCB-OSDKEY	OSD Keyboard for RT22615B	1
4	PIN-MLS-XLCDBRK	XL Pinball Display - Right Bracket	1
5.1	PIN-PLS-XLCDSPR	XL LCD Spacer (Rev 3)	2
5.2	PIN-MLS-XLCDGRL	XL LCD Grill (Rev 3)	2
5.3	000-SPK-PLG3.2	Pyle PLG3.2, 3.5" 4 Phm, Coaxial	2
6	PIN-MLS-XLCDBEZ	XL Pinball Display - Speaker B	2
7	FSS-N06-XFH075A	#6 x 3/4" SMS, Torx Security Screw	8
8	FSS-063-NSS125C	Spiral Shank Screw, 6-32 x 1-1	4
9	FNT-063-KEC0000	6-32 Kep Nut Clear Zinc	13
10	000-PLM-NC25CLP	1/4" Non-Captive Cable Clamp	3

# AFM-SUB-50059CAB

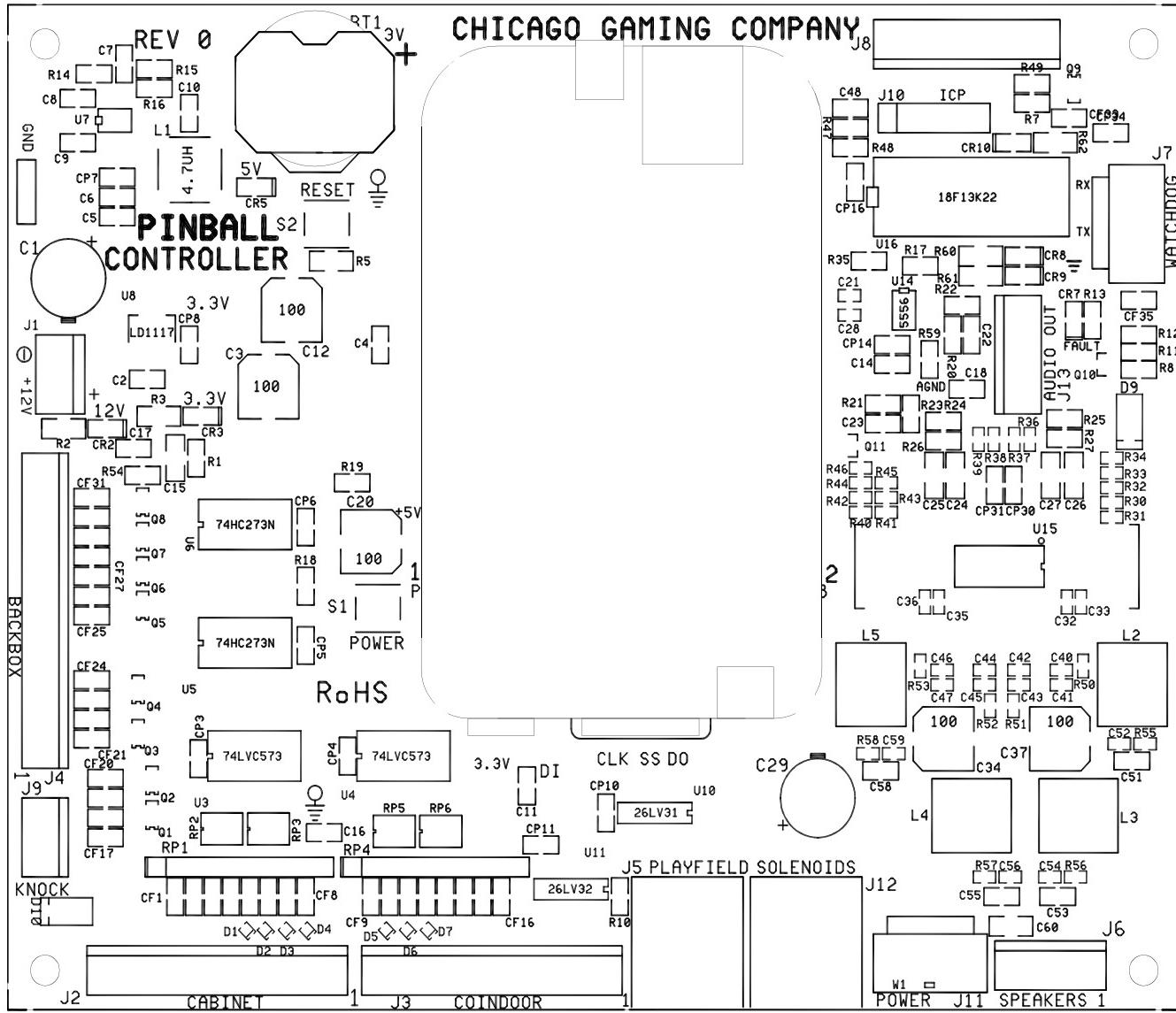
## Cabinet Assembly



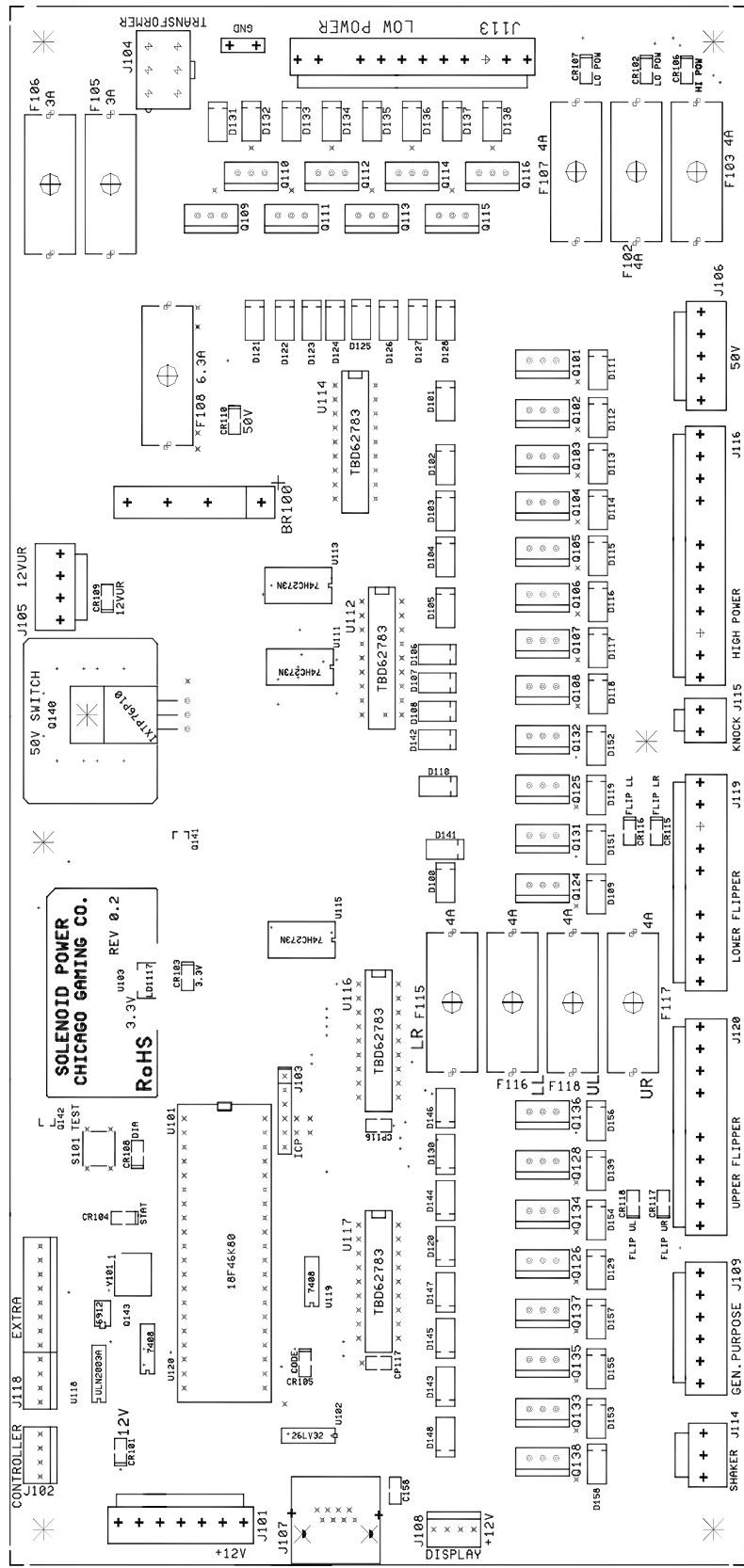
### Miscellaneous Parts (Not Shown)

Item	Part Number	Description	Part Number	Description
1	A-16773	Lever Guide Assembly	PIN-A-17195	Tilt Switch Assy.
2	20-9663-B-4	Push Button, Round	A-19562,1	Stay Arm Assembly
3	MM-MLS-DRIPPLT	Drip Plate - Narrow	01-12352	Clip Bracket
4	A-16883-4	Flipper Button w/Spring (2)	01-9011.I-L	Backbox Mtg. Bracket, Left
5	A-20729-5	4-Ball Cashbox Assembly	01-9011.I-R	Backbox Mtg. Bracket, Right
6	PIN-SUB-POWRBOX	Power Interface Assy.	01-6389-1	Cashbox Lock Bracket
7	PIN-TRF-PTRANS	WPC Transformer	08-7028-T	Playfield Glass
8	000-SPK-8IN4OHM	8" Woofer, 4 Ohms, 190 W	08-7377	Leg Leveler Adjuster, 3"
9	PIN-20-9347	Toggle Latch	20-6500	Steel Ball, 1-1/16" (4)
10	000-ELE-RS15012	Switching Power Supply, 12V, 150W		
11	A-19514	Leg Assembly, Chrome (4)		
12	0-12615	Front Molding Assembly		
13	20-6502-A	Plumb Bob		
14	04-10346	Tilt Mechanism Assembly		
16	PIN-PCB-FLIPBTN	Opto Flipper Assembly (2)		Cabinet Cables:
17	PIN-MLS-INLTCVR	Line Cord Cover		
18	A-12359-3	Side Molding Assembly (2)	PIN-CBL-CABINET	Cabinet Cable
19	AFM-SUB-CABDECAL	MM Cabinet with Decals	PIN-CBL-ACPOWER	AC Power Cable
20	20-9663-2	Push Button w/Sw., Start (Green)	PIN-CBL-PFPOWER	Playfield Power Cable
21	01-11400	Leg Plate (4)		
22	A-18249-3	Cable & Interlock Switch Assy. Coin		
23	09-61000-1	Door-U.S.A.		
24	01-11408	Plate Spacer (2)		
25	PIN-SUB-SHAKER2	Shaker Motor Assy.		

**AFM-SUB-CONTRLR**  
**Attack from Mars Controller Board**



**PIN-PCB-SOLPOWR**  
**Attack from Mars Solenoid Power Board**



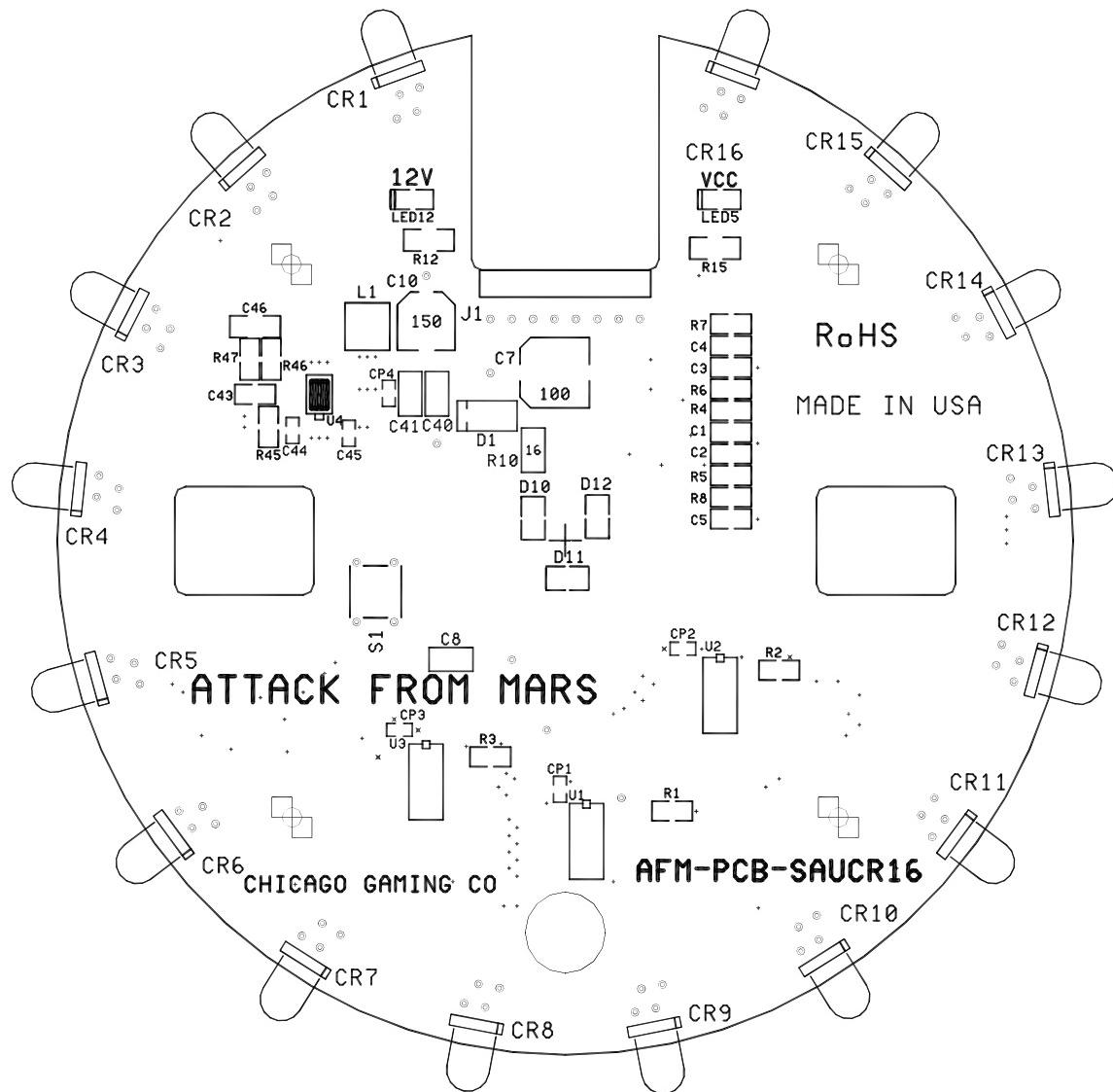
# AFM-PCB-PLAYFLD

## Attack from Mars Playfield Board

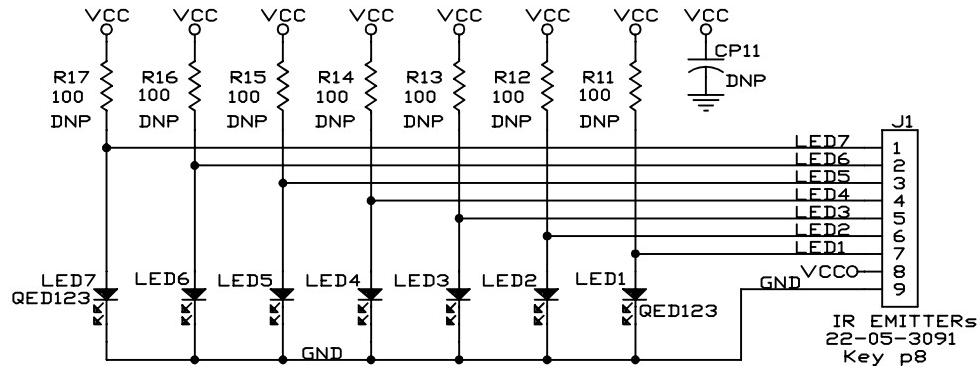
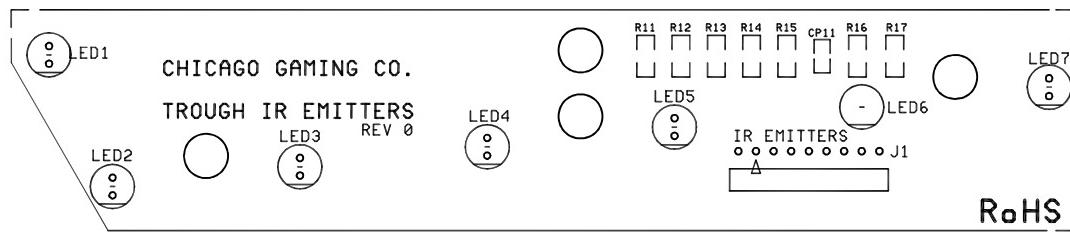


# AFM-PCB-SAUCR16

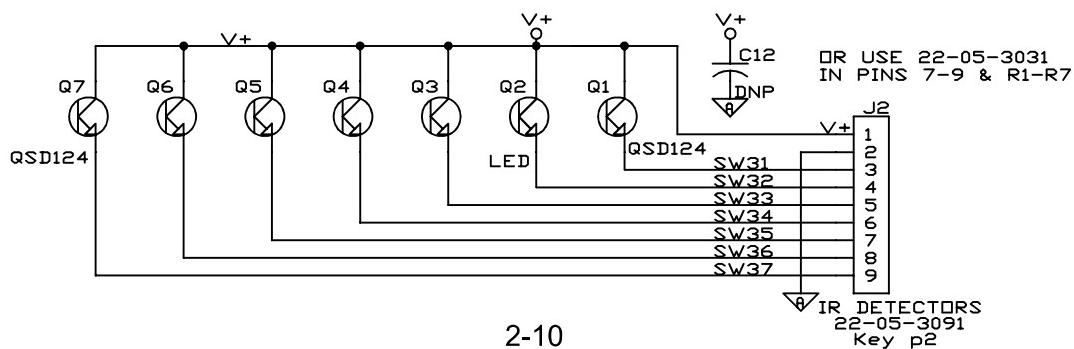
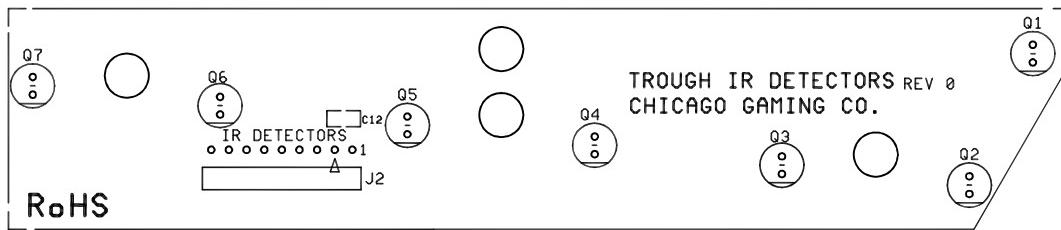
## Attack from Mars 16-LED Saucer Board



# PIN-PCB-TRGHLED Trough IR LED PCB Assembly

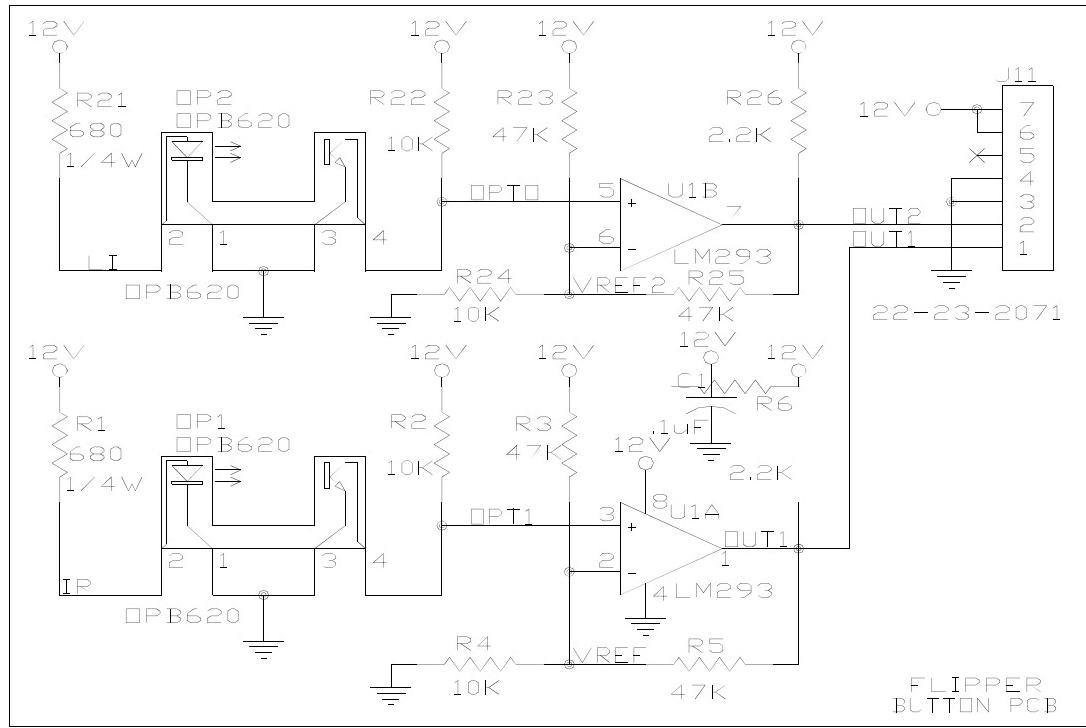
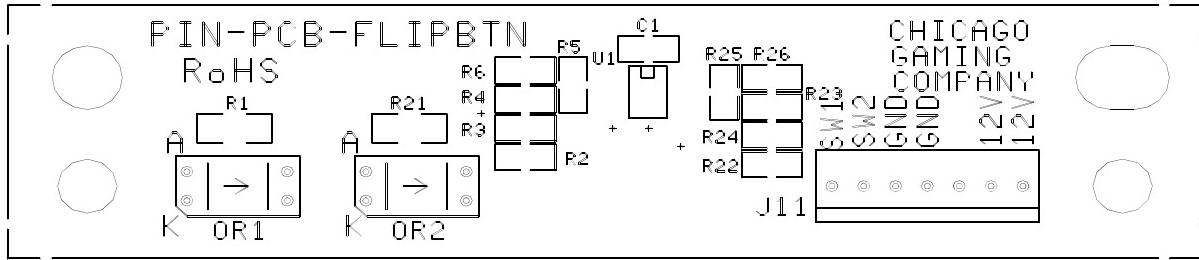


# PIN-PCB-TRGHDET Trough IR Photo Transistor PCB Assembly



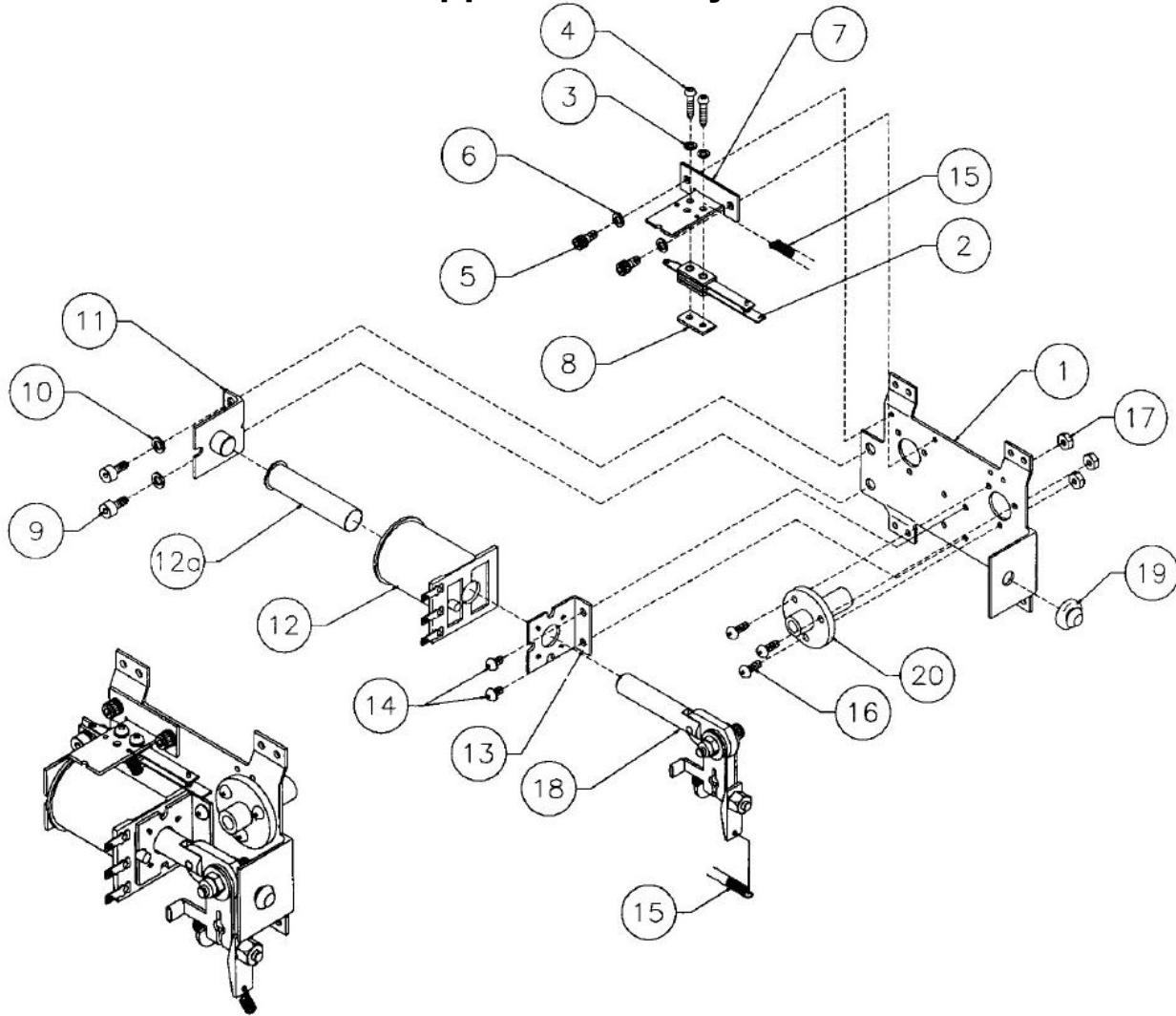
# PIN-PCB-FLIPBTN

## Flipper Opto PCB Assembly



# PIN-SUB-A15849L2

## Flipper Assembly

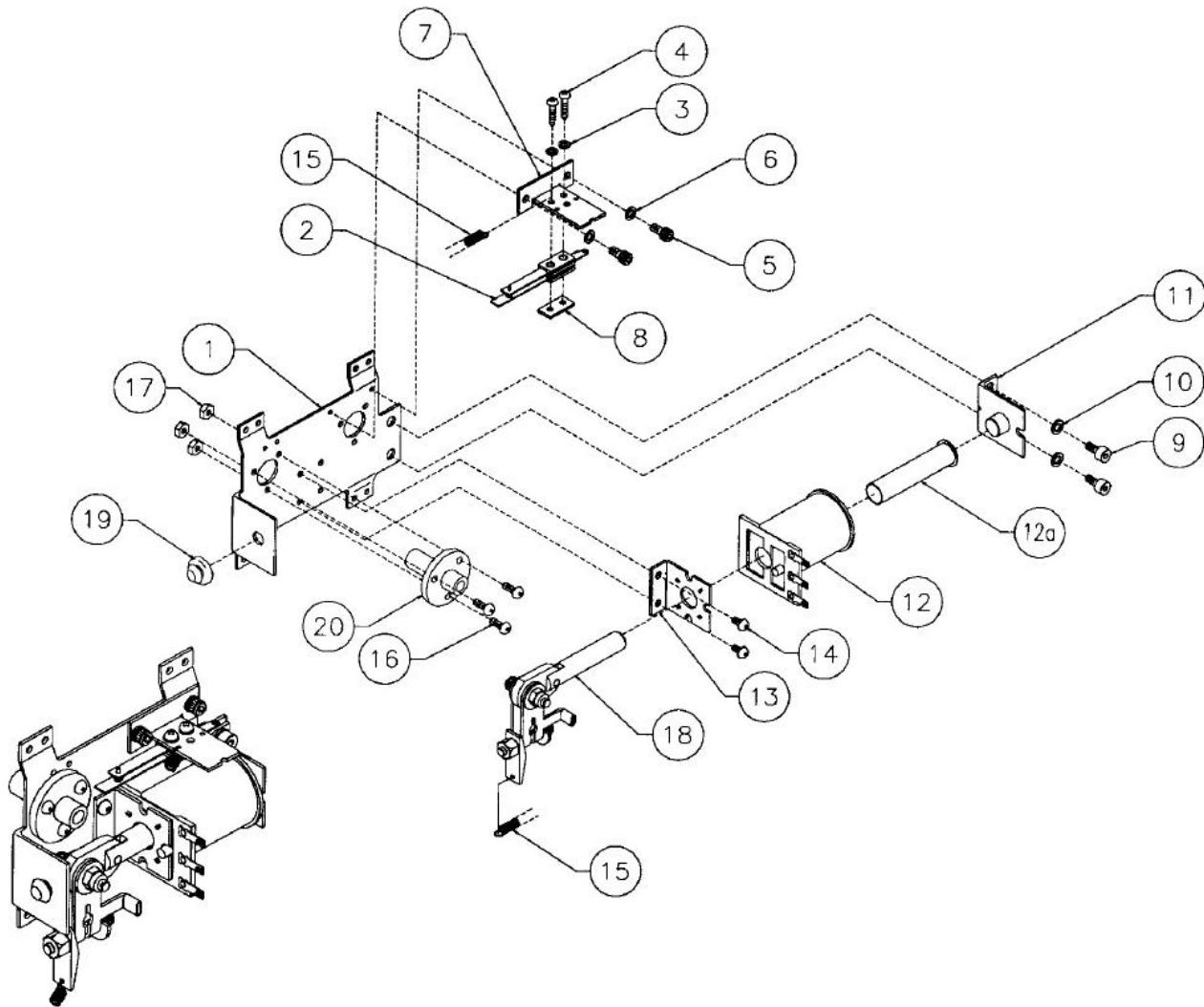


Item	Part Number	Description	Item	Part Number	Description
1	B-13104-L	Flipper Base Assembly, Left	18	A-15848-L	Crank Link Assembly, Left
2	SW-1A-194	Switch Assembly	a)	A-17050-L	Flipper Crank Assembly, Left
3	4701-00002-00	Lockwasher #6 Split	b)	A-15847	Flipper Link Assembly
4	4105-01019-10	Sh. Metal Screw, #5 x 5/8"	c)	02-4676	Link Spacer Bushing
5	4008-01079-05	Mach. Screw, 8-32 x 5/16"	d)	4010-01086-14	Cap Screw, 10-32 x 7/8"
6	4701-00003-00	Lockwasher #8 Split	e)	4700-00023-00	Flat Washer, 5/8 x 13/64 x 16ga.
7	01-9375	Switch Mounting Bracket	f)	4701-00004-00	Lockwasher #10 Split
8	20-6516	Speednut, Tinnerman	g)	4410-01132-00	Nut 10-32 ESN
9	4010-01066-06	Cap Screw, 10-32 x 3/8"	19	23-6577	Bumper Plug, 5/8"
10	4701-00004-00	Lockwasher #10 Split	20	03-7568	Flipper Bushing
11	A-12390	Flipper Stop Assembly			
12	FL-11629	Flipper Coil, Blue			
a)	03-7066-5	Coil Tubing			
13	01-7695-1	Solenoid Bracket			
14	4006-0101704	Mach. Screw, 6-32 x 1/4"	21	23-6695	Flipper Rubber Ring, Black
15	10-364	Spring	22	20-10110-5	Flipper Bat & Shaft AssEmby
16	4006-01005-06	Mach. Screw, 6-32 x 3/8"			
17	4406-01117-00	Nut 6-32 Hex.			

**Associated Parts:**  
(Not Shown)

# PIN-SUB-A15849R2

## Flipper Assembly



Item	Part Number	Description	Item	Part Number	Description
1	B-13104-R	Flipper Base Assembly, Left	18	A-15848-R	Crank Link Assembly, Left
2	SW-1A-194	Switch Assembly	a)	A-17050-R	Flipper Crank Assembly, Left
3	4701-00002-00	Lockwasher #6 Split	b)	A-15847	Flipper Link Assembly
4	4105-01019-10	Sh. Metal Screw, #5 x 5/8"	c)	02-4676	Link Spacer Bushing
5	4008-01079-05	Mach. Screw, 8-32 x 5/16"	d)	4010-01086-14	Cap Screw, 10-32 x 7/8"
6	4701-00003-00	Lockwasher #8 Split	e)	4700-00023-00	Flat Washer, 5/8 x 13/64 x 16ga.
7	01-9375-1	Switch Mounting Bracket	f)	4701-00004-00	Lockwasher #10 Split
8	20-6516	Speednut, Tinnerman	g)	4410-01132-00	Nut 10-32 ESN
9	4010-01066-06	Cap Screw, 10-32 x 3/8"	19	23-6577	Bumper Plug, 5/8"
10	4701-00004-00	Lockwasher #10 Split	20	03-7568	Flipper Bushing
11	A-12390	Flipper Stop Assembly			
12	FL-11629	Flipper Coil, Blue			
a)	03-7066-5	Coil Tubing			
13	01-7695	Solenoid Bracket			
14	4006-0101704	Mach. Screw, 6-32 x 1/4"	21	23-6695	Flipper Rubber Ring, Black
15	10-364	Spring	22	20-10110-5	Flipper Bat & Shaft Assmby
16	4006-01005-06	Mach. Screw, 6-32 x 3/8"			
17	4406-01117-00	Nut 6-32 Hex			

**Associated Parts:**  
(Not Shown)

21

23-6695

Flipper Rubber Ring, Black

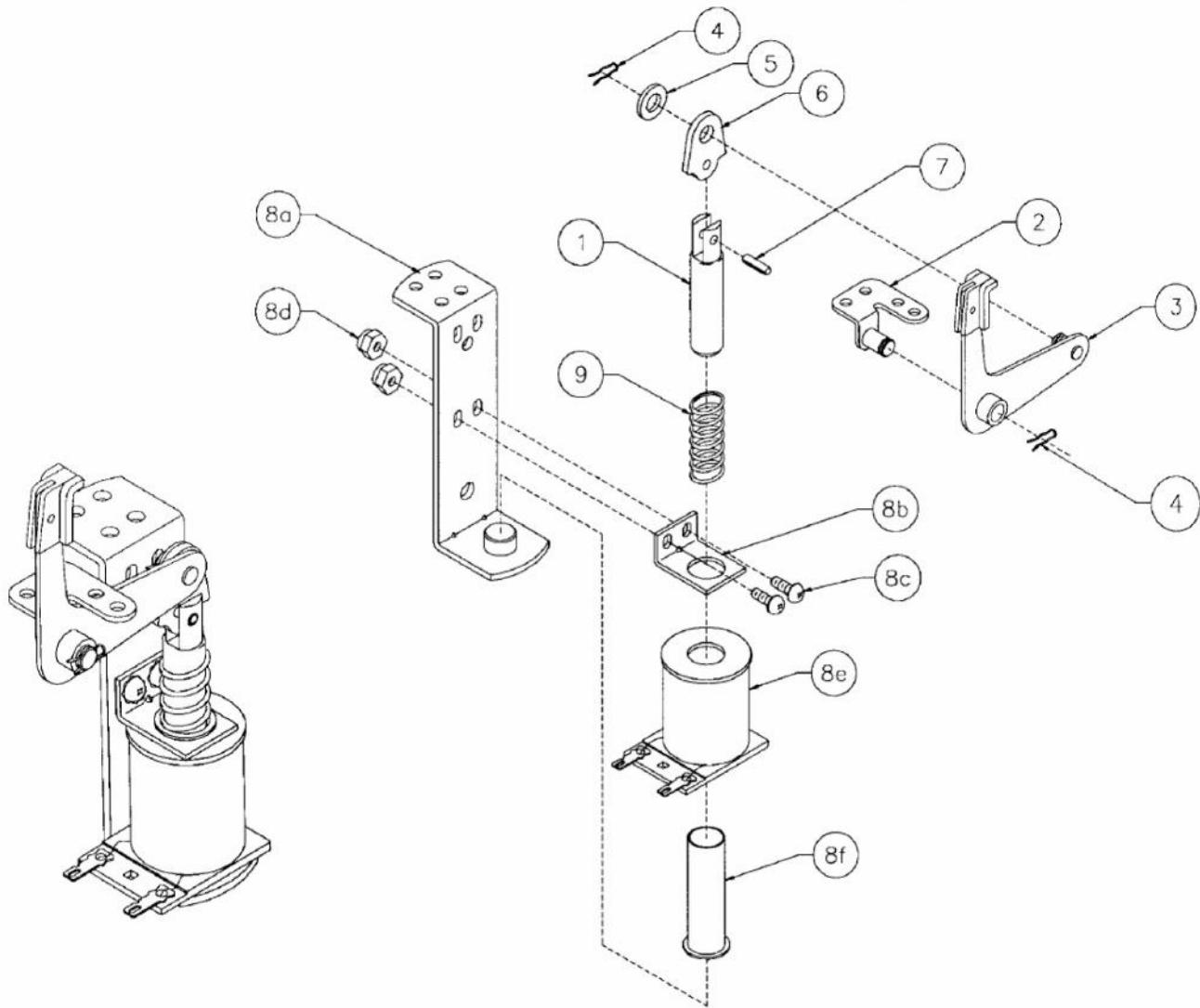
22

20-10110-5

Flipper Bat & Shaft Assmby

# PIN-SUB-A17811

## Kicker Arm (Slingshot) Assembly

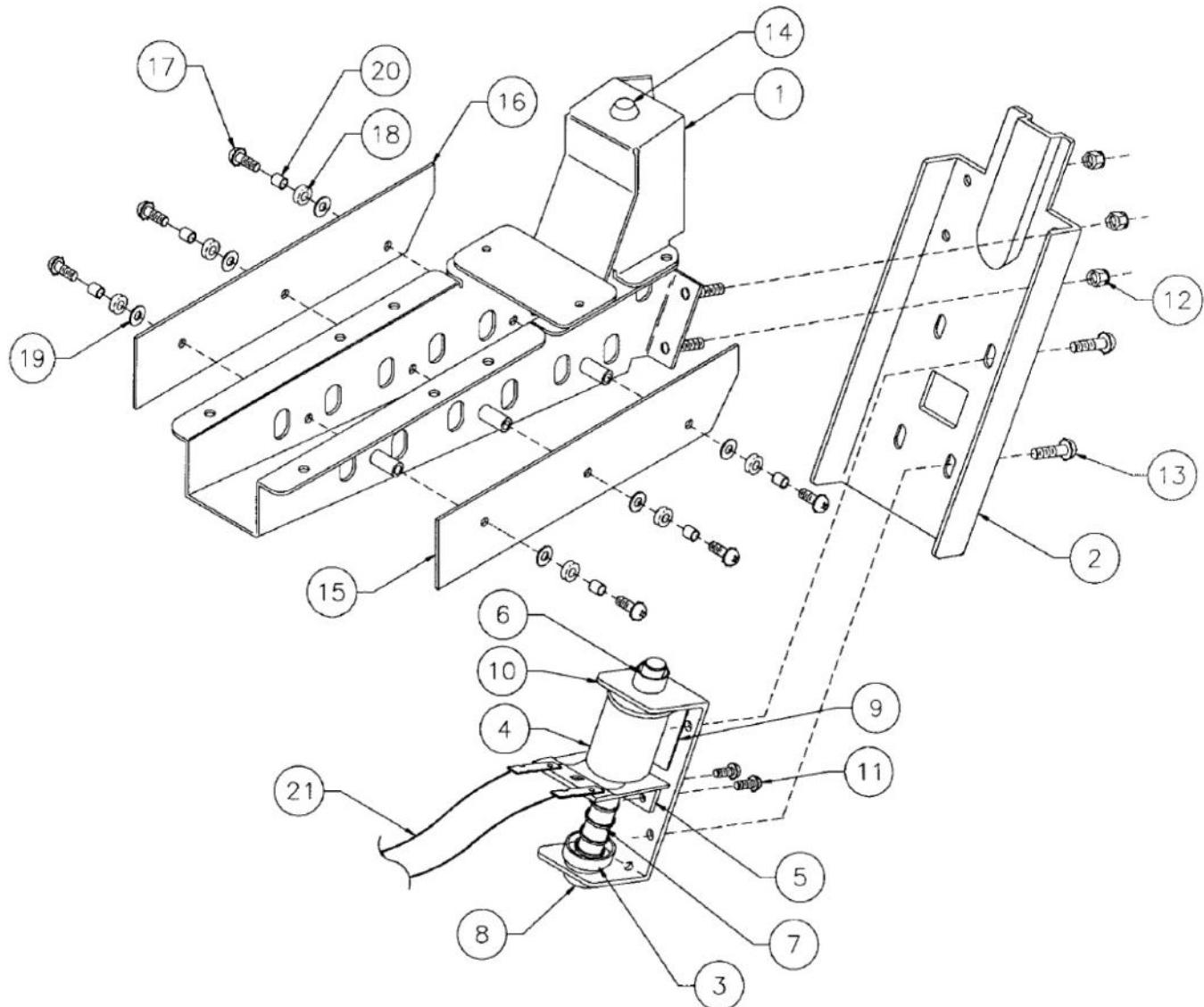


### Associated Parts for Right & Left Kickers

Item	Part Number	Description	Item	Part Number	Description
1	02-2364	Coil Plunger	8	B-9362-L-2	Coil & Bracket Assembly, Left
2	A-17810	Mounting Bracket Assembly		B-9362-R-3	Coil & Bracket Assembly, Right
3	A-12664	Kicker Crank Assembly	a)	A-17808	Bracket & Stop Assembly
4	12-6227	Hairpin Clip	b)	01-8-508-S	Coil Retaining Bracket
5	4700-00030-00	FW, 17/64 x 1/2 x 15ga.	c)	4006-01017-06	Mach. Screw, 6-32 x 3/8"
6	03-8085	Armature Link	d)	4406-01119-00	Nut, 6-32 ESN
7	20-8716-5	Roll Pin, 1/8" x 7/16"	e)	AE-26-1200	Coil Assembly
			f)	03-7066	Coil Tubing
			9	10-128	Spring

# PIN-SUB-A199631

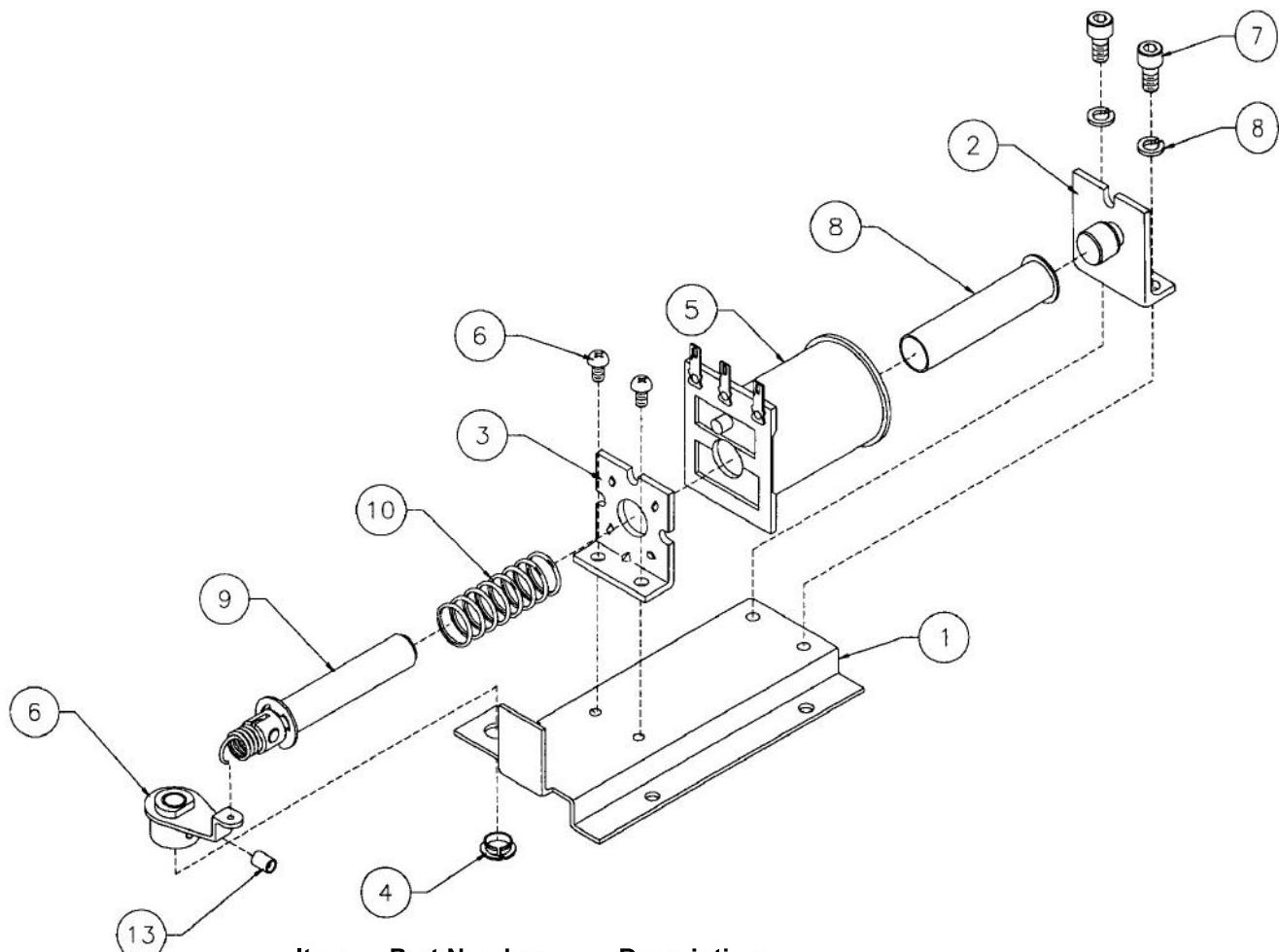
## Ball Trough Assembly Complete



Item	Part Number	Description	Item	Part Number	Description
1	A-16809-2	Ball Trough Welded Assy.	12	4408-01119-00	Nut 8-32 ESN
2	01-11587	Ball Trough Front	13	4008-01017-06	Mach. Screw, 8-32 x 3/8"
3	A-6306-2	Bell Armature Assembly	14	23-6702	Bumper Plug
4	AE-26-1500	Coil Assembly	15	PIN-PCB-TRGHLED	Trough IRED LED PCB Assembly
5	01-8-508-T	Solenoid Assembly	16	PIN-PCB-TRGHDET	Trough IRED Transistor PCB Assy.
6	03-7067-5	Coil Tubing	17	4006-01003-10	Mach. Screw, 6-32 x 5/8" SEMS
7	10-135	Spring	18	23-6626	Rubber Grommet
8	23-6420	Rubber Grommet	19	4700-00004-00	Flat Washer, 9/64 x 7/16 x 21ga.
9	03-8523	Insulator	20	02-4975	Bushing
10	01-1158	Coil Mounting Bracket	21	PIN-CBL-COILOV	2-Pin Coil Cable – Orange Violet
11	4008-01017-05	Mach. Screw, 8-32 x 5/16"			

# PIN-SUB-A17241

## Ramp Diverter Assembly



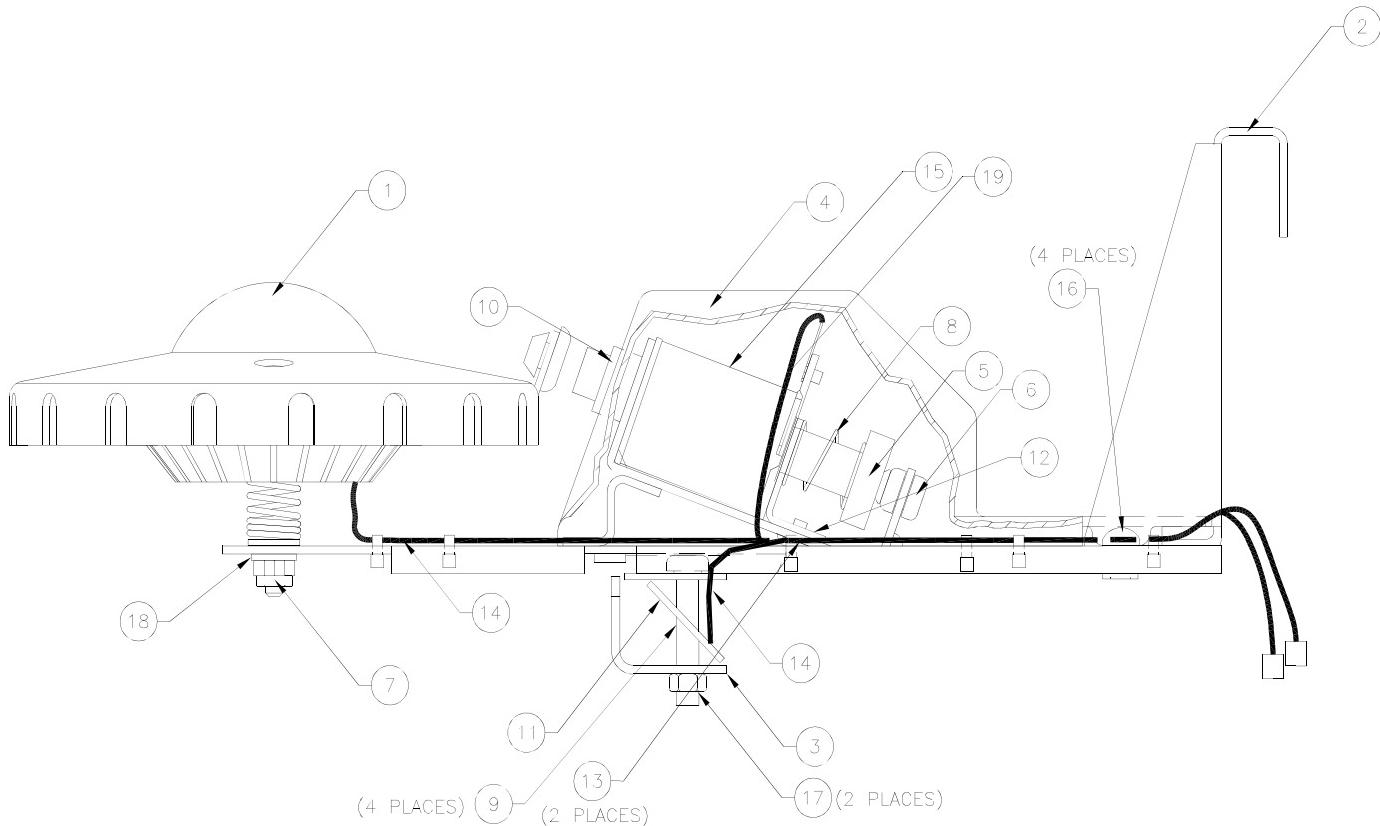
Item	Part Number	Description
1	01-11957	Mounting Bracket
2	A-12390	Flipper Stop Bracket
3	01-7695	Solenoid Bracket
4	20-8790	Nyliner Bearing
5	A-20099	Coil Assembly
6	4006-01017-04	Mach. Screw, 6-32 x 1/4"
7	4010-01066-06	Mach. Screw, 10-32 x 3/8"
8	4701-00004-00	Lockwasher #10 Split
9	03-7066-5	Coil Tubing
10	A-16636	Diverter Plunger Assembly
11	10-303	Spring Master
12	A-14185	Drive Arm Assembly
13	4010-01169-04	Set Screw, 10-32 x 1/4"

**Associated Parts:**  
(Not Shown)

11	A-20556 20-10283 4700-00030-00	Shaft & Blade Assembly Bearing Flat Washer, 17/64 x 1/2"
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# AFM-SUB-A20608

## Saucer Assembly



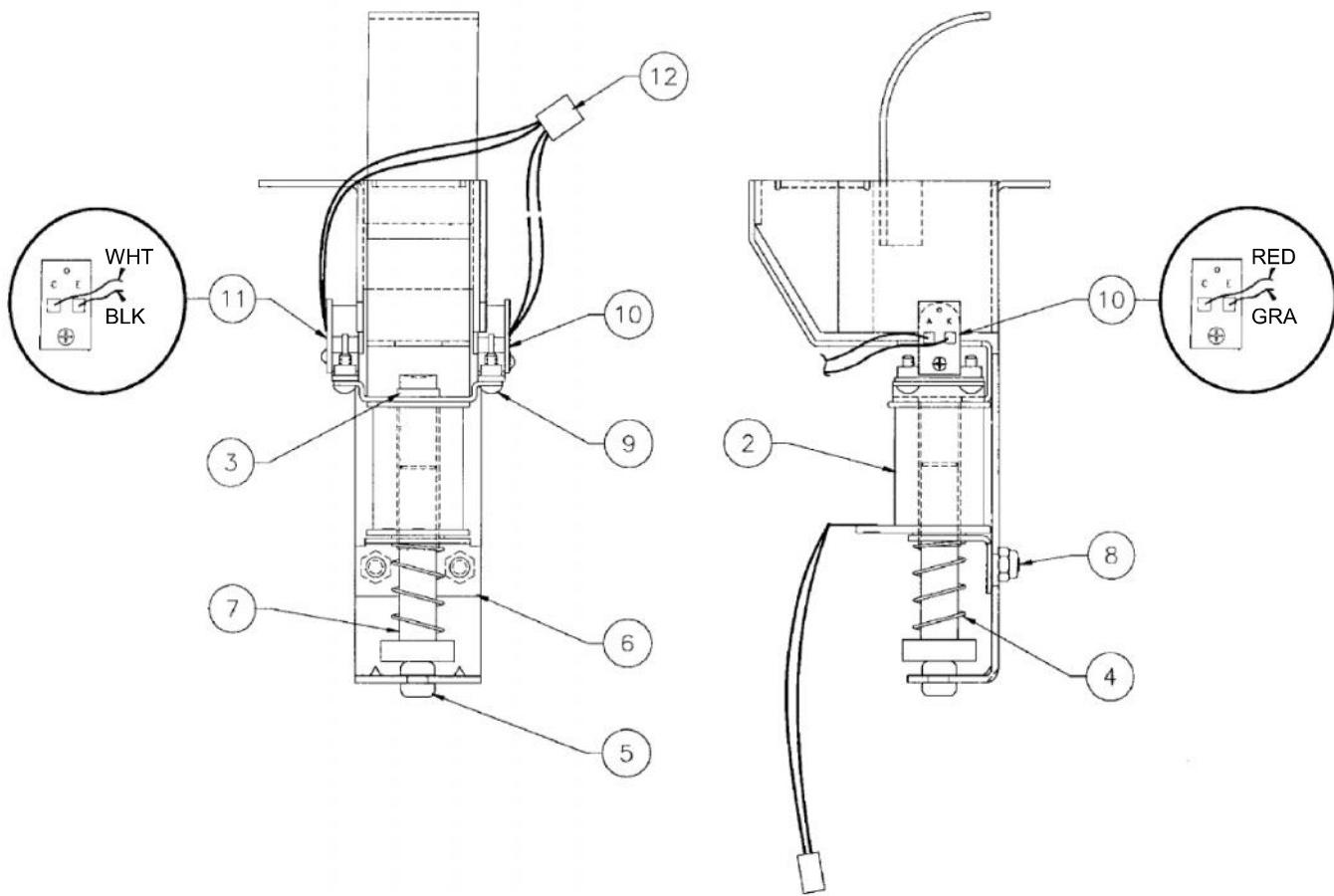
Item	Part Number	Description	Item	Part Number	Description
1	AFM-A-20713	Saucer Assembly	11	AFM-PCB-STROBE	AFM Strobe PCB
2	04-10315.1	Saucer Support Weldment	12	01-8-508-T	Coil Retainer Bracket
3	03-9478.3	Strobe Light Cover	13	4008-01003-04	Mach. Screw, 8-32 x 1/4"
4	A-20870	Coil Cover Assembly	14	AFM-CBL-SUCRCBL	Saucer and Strobe Cable
5	04-10361	Saucer Armature	15	AE-26-1500	Coil Assembly
6	23-6420	Rubber Grommet	16	4008-01017-05	Mach. Screw, 8-32
7	4408-01119-00	Nut 8-32 ESNA	17	4408-01119-00	Nut 8-32 ESNA
8	10-135	Armature Spring	18	4700-00011-00	Flatwasher, 11/64 x 7/16 x 16ga.
9	AFM-HDW-SPCR45	Plastic 45 Degree Spacer	19	AFM-CBL-SACRSHK	Saucer Shaker Coil Cable
10	03-7067-3	Coil Tubing			

Metalized Saucer Top  
AFM-03-94671M

Classic Saucer Top  
AFM-03-94671

# AFM-SUB-A20573

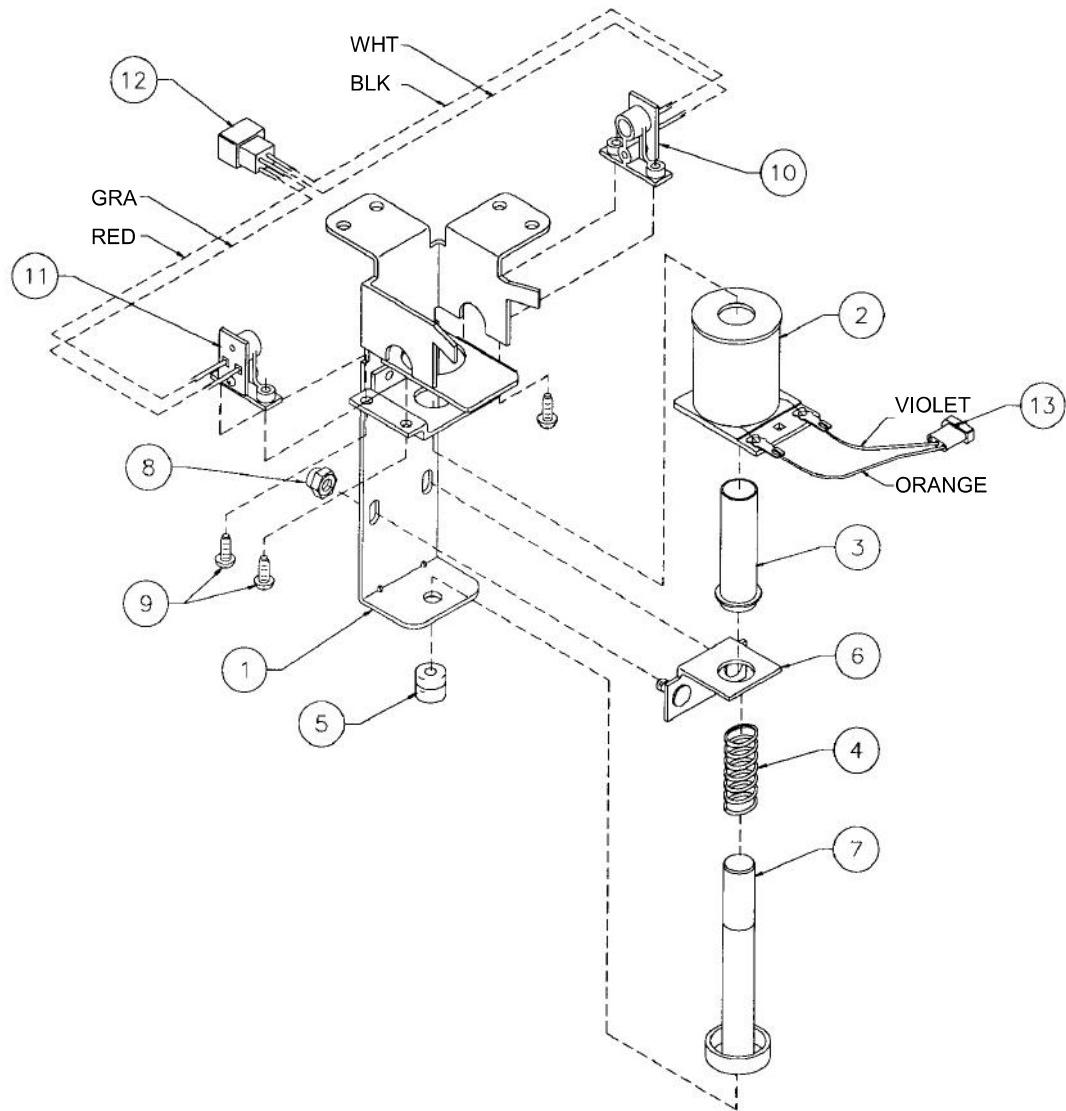
## Right Popper Assembly



Item	Part Number	Description
1	04-10279.1	Weldment Right Popper
2	AE-25-1000	Coil Assembly
3	03-7067	Coil Tubing
4	10-135	Solenoid Spring
5	23-6420	Rubber Grommet
6	04-10086.1	Mouting Bracket
7	A-17767	Bell Armature Assembly
8	4408-01119-00	Nut, 8-32 ESN
9	4106-01013-06	Sh. Metal Screw, #6 x 3/8"
10	PIN-A-16908	LED Assembly, RTV
11	PIN-A-16909	Photo Trans. Assy, RTV
12	AFM-CBL-OPTOSW	Opto Switch Cable
13	PIN-CBL-COILOV	2-Pin Coil Cable – Orange Violet

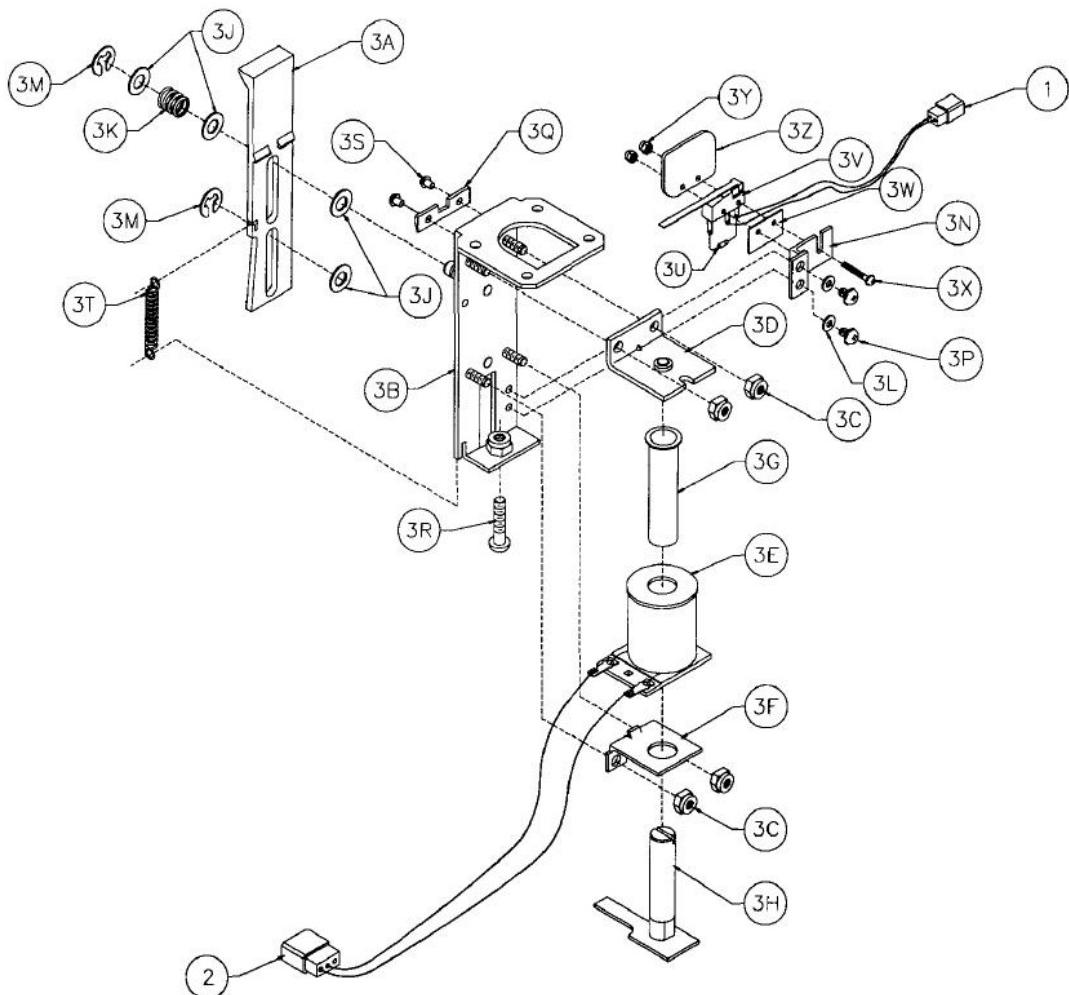
# AFM-SUB-A20633

## Left Popper Assembly



Item	Part Number	Description
1	04-10312	Weldment Left Popper
2	AE-23-800	Coil Assembly
3	03-7067	Coil Tubing
4	10-135	Solenoid Spring
5	23-6420	Rubber Grommet
6	04-10086.1	Mounting Bracket
7	A-17767	Bell Armature Assembly
8	4408-01119-00	Nut, 8-32 ESN
9	4106-01013-06	Sh. Metal Screw, #6 x 3/8"
10	PIN-A-16908	LED Assemby, RTV
11	PIN-A-16909	Photo Trans. Assy, RTV
12	AFM-CBL-OPTOSW	Opto Switch Cable
13	PIN-CBL-COILOV	2-Pin Coil Cable – Orange Violet

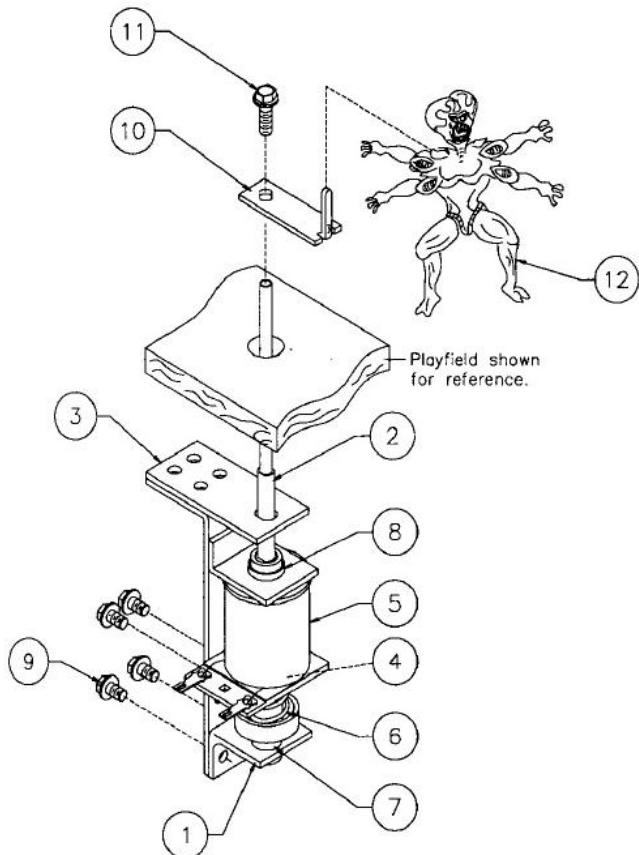
**AFM-PWC-A20657**  
**1-Bank Drop Target Assembly w/Cables**



Item	Part Number	Description	Item	Part Number	Description
1	PIN-CBL-DTARGSW	Cable Assembly	3U)	5070-09054-00	Diode 1N4001
2	PIN-CBL-COILOB	2-Pin Coil Cable - Orange Brown	V)	5647-12693-31	Mini Micro Switch
3	A-16267-2	1-Bank Drop Target Assembly	W)	01-8600	Switch Insulator
A)	03-8750-2	Target, Flush	X)	4002-01105-12	Mach Screw, 2-56 x 3/4"
B)	A-14617	Bracket & Post Assembly	Y)	4402-01119-00	Nut, 2-56 ESNA
C)	4408-01119-00	Nut #8 ESNA	Z)	03-8630	Actuator Guide
D)	A-11397	Stop Bracket Assembly			
E)	AE-26-1200	Coil Assembly			
F)	01-8413	Bracket & Coil Mounting			
G)	03-7066-4	Coil Tubing			
H)	A-11388-2	Plate & Reset Plate Assembly			
J)	4700-00072-00	Flat Washer, 17/64 x 1/2 x 22ga.			
K)	10-392	Spring – Compression			
L)	4700-00003-00	Flat Washer, 1/8 x 9/32 x 21ga.			
M)	20-8712-25	"E"-Ring, 1/4" Shaft			
N)	01-10183	Switch Bracket			
P)	4006-01003-03	Mach. Screw, 6-32 x 3/16"			
Q)	03-8034	Stop Single Target			
R)	4010-01025-14	Mach. Screw, 10-32 x 7/8"			
S)	07-6688-17N	Rivet, 5/32 x 7/32"			
T)	10-433	Spring, Extension			

# AFM-SUB-A205791 & AFM-SUB-A205792

## Alien Mechanism Assembly



Item	Part Number	Description
1	01-14172	Coil Stop Bracket
2	04-10360	Armature Assembly
3	04-10311	Alien Weldment Bracket
4	01-8-508-T	Coil Retainer Bracket
5	AE-26-1500	Coil Assembly
6	10-135	Spring – Plunger
7	23-6420	Rubber Grommet
8	03-7067	Coil Tubing
9	4008-01113-04	Mach. Screw, 8-32 x 1/4"

### Associated Parts:

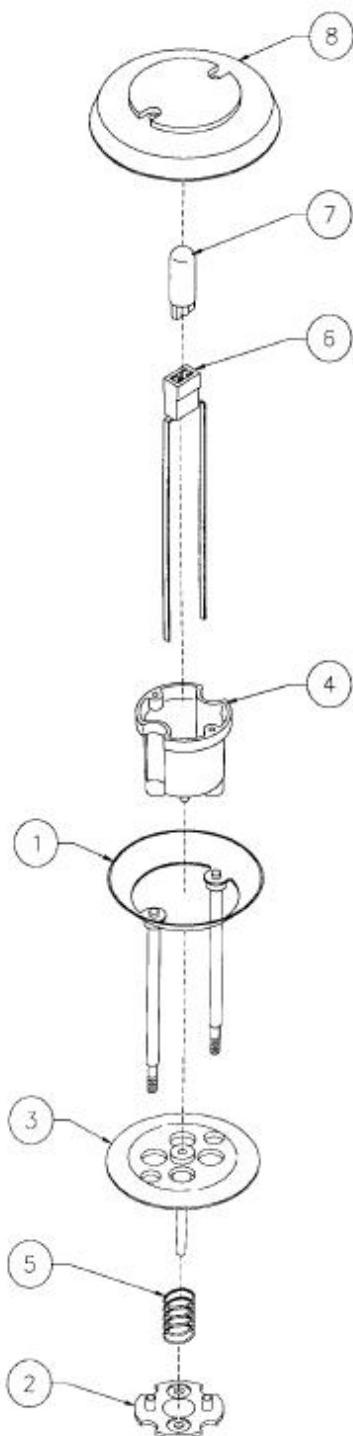
10	01-14173.1	Figurine Support Bracket, UR
11	4008-01168-6	Mach. Screw, 8-32 x 3/8"
12	23-6768	Alien Figure

**The following are brackets substituting item #10.**

10	01-14169.2	Figurine Support Bracket, LL
	01-14170.1	Figurine Support Bracket, UL
	01-14173.1	Figurine Support Bracket, UR
	01-14171.2	Figurine Support Bracket, LR

# PIN-SUB-B94143

## Jet Bumper Assembly



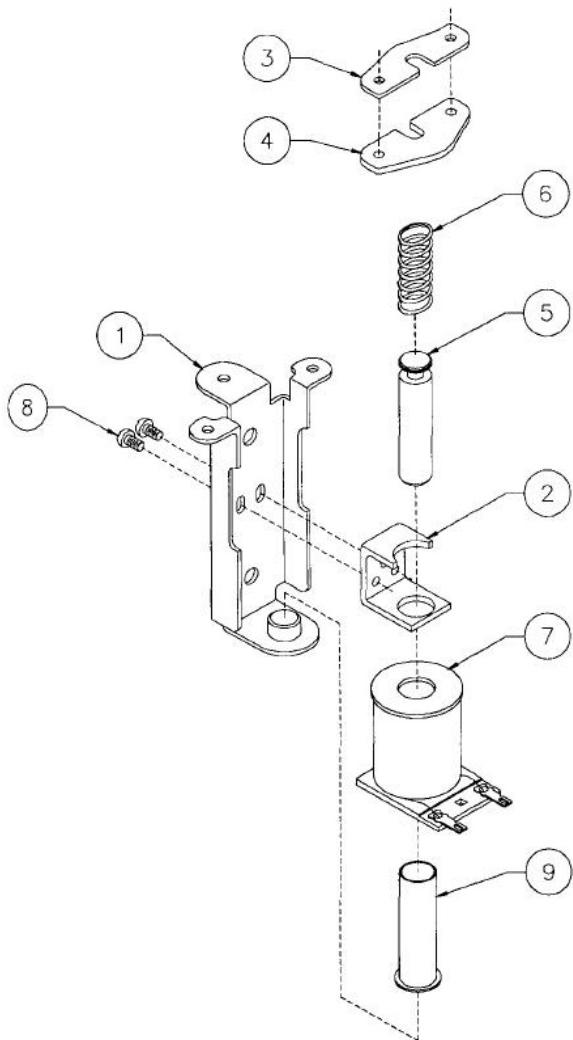
Item	Part Number	Description
1	A-4754	Bumper Ring Assembly
2	03-6009-A5	Bumper Base, White
3	03-6035-4	Bumper Wafer, Red
4	03-7443-5	Bumper Body, White
5	10-7	Spring
6	PIN-24-8776-C	Socket-Wedge Base
7	000-LMP-LED6VT3	LED, #555 Type, Faceted Cap, T3-1/4, Warm White, 6V

### Associated Parts:

8	03-9007-9	Jet Bumper Cap, Red (3)
9	PIN-PLS-JETSPCR	Jet Bumper Socket Spacer

# PIN-SUB-A94152

## Jet Bumper Coil Assembly



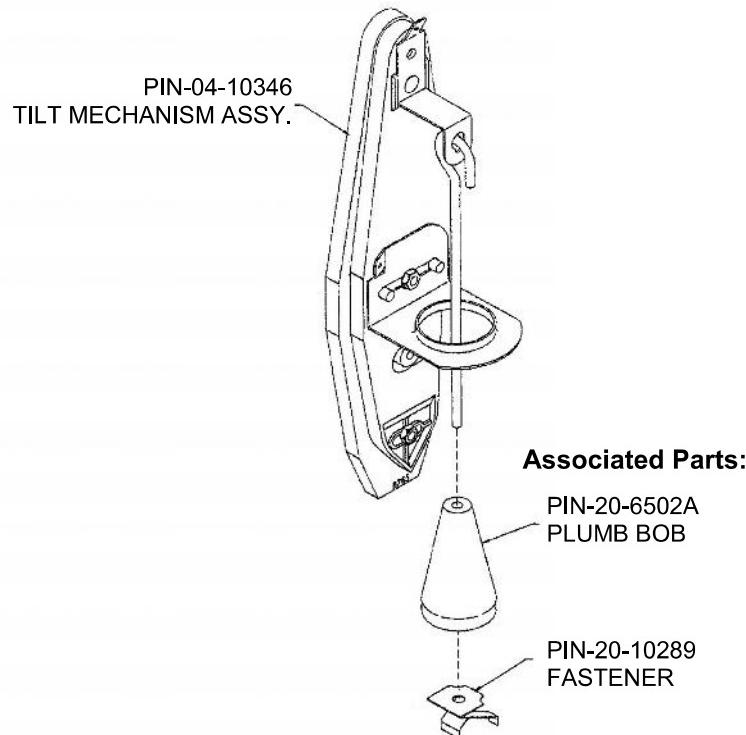
Item	Part Number	Description
1	B-7417	Bracket & Stop Assembly
2	01-1747	Coil Retaining Bracket
3	01-5492	Armature Link, Steel
4	01-5493	Armature Link, Bakelite
5	02-3406-1	Coil Plunger
6	10-326	Armature Spring
7	AE-26-1200	Coil Assembly
8	4006-01017-04	Mach. Screw, 6-32 x $\frac{1}{4}$ "
9	03-7066	Coil Tubing

**Associated Parts:**  
(Not Shown)

10	B-12030-2	Leaf Switch Assembly
a)	A-16443	Switch & Diode Assembly
b)	01-1168	Switch Mounting Bracket
c)	01-3670	Switch Plate
d)	03-7395	Switch Actuator
e)	4005-01003-12	Mach. Screw, 5-40 x $\frac{3}{4}$ "
f)	4405-01117-00	Nut 5-40 Hex.

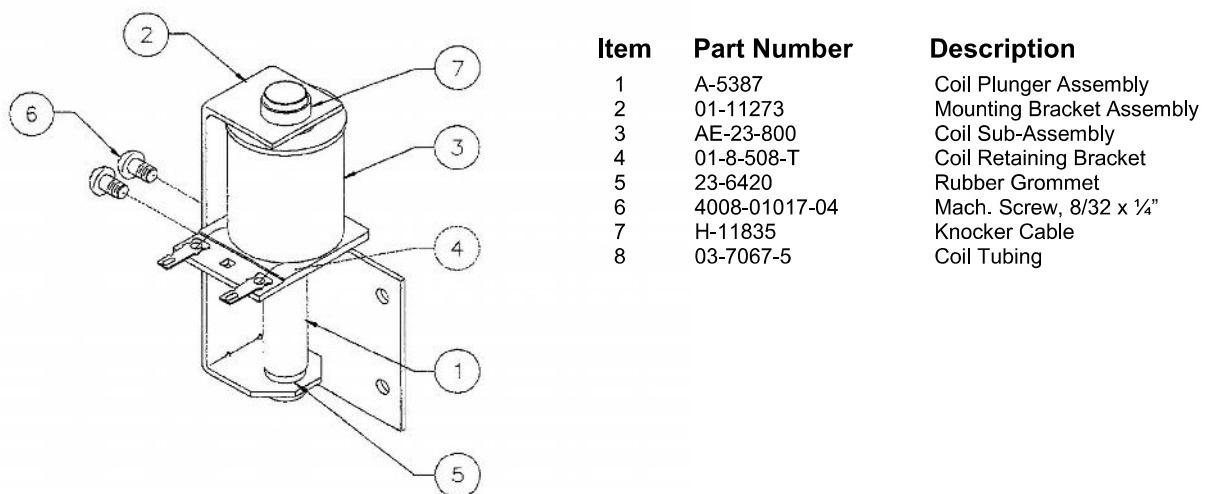
## **PIN-04-10346**

### **Tilt Mechanism Assembly**

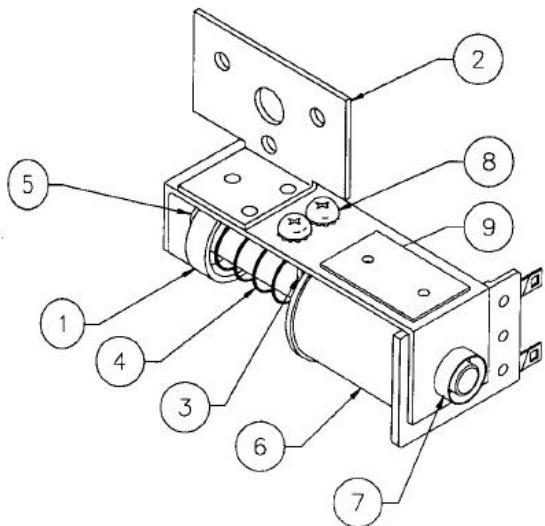


## **PIN-SUB-B106861**

### **Knocker Assembly**

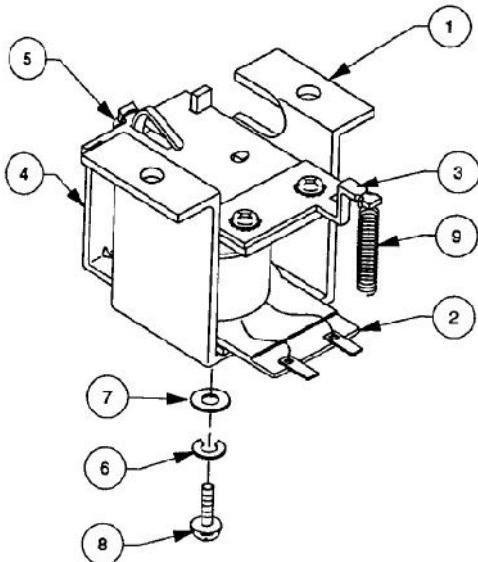


## PIN-SUB-A14525 Kicker Bracket Assembly



Item	Part Number	Description
1	A-6306-2	Bell Armature Assembly
2	A-14526	Mounting Bracket Assembly
3	01-8-508-T	Solenoid Bracket
4	10-135	Solenoid Spring
5	23-6420	Rubber Grommet
6	AE-23-800	Coil Assembly
7	03-7067-5	Coil Tubing
8	4008-01017-04	Mach. Screw, #8-32 x 1/4"
9	03-8523	Insulator

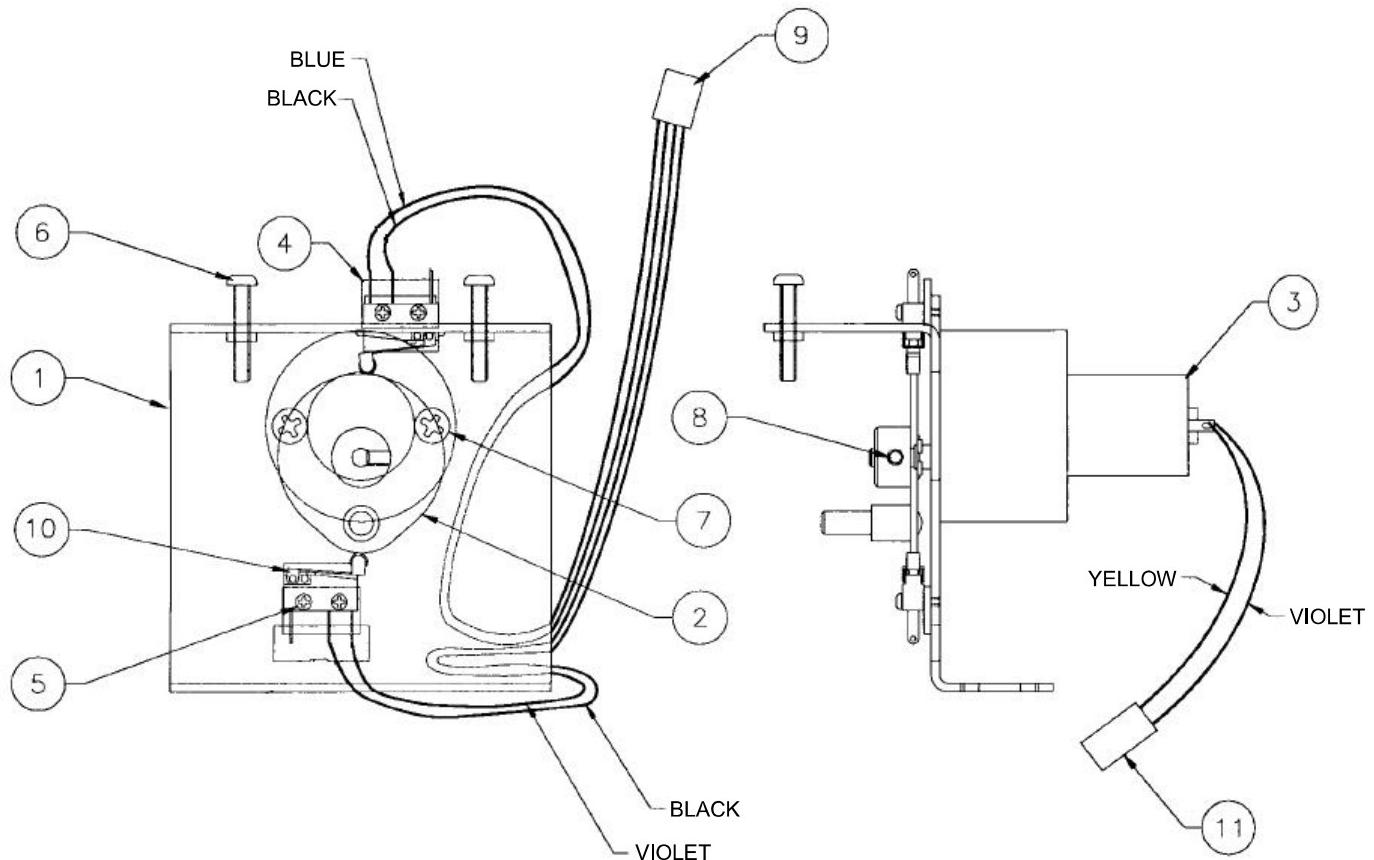
## PIN-SUB-A17796 Ball Gate Actuator Assembly



Item	Part Number	Description
1	01-12348	Ball Gate Coil Bracket
2	PIN-A-27700	12V Coil Assembly
3	A-11146	Armature Assembly
4	A-6892	Frame & Eyelet Assembly
5	10-120	Spring
6	4701-00003-00	Lockwasher, #18 Split
7	4700-00089-00	FW, 11/64 x 7/16 x 16ga.
8	4008-01021-07	Mach. Screw, 8-32 x 7/16"
9	10-194	Extension Spring

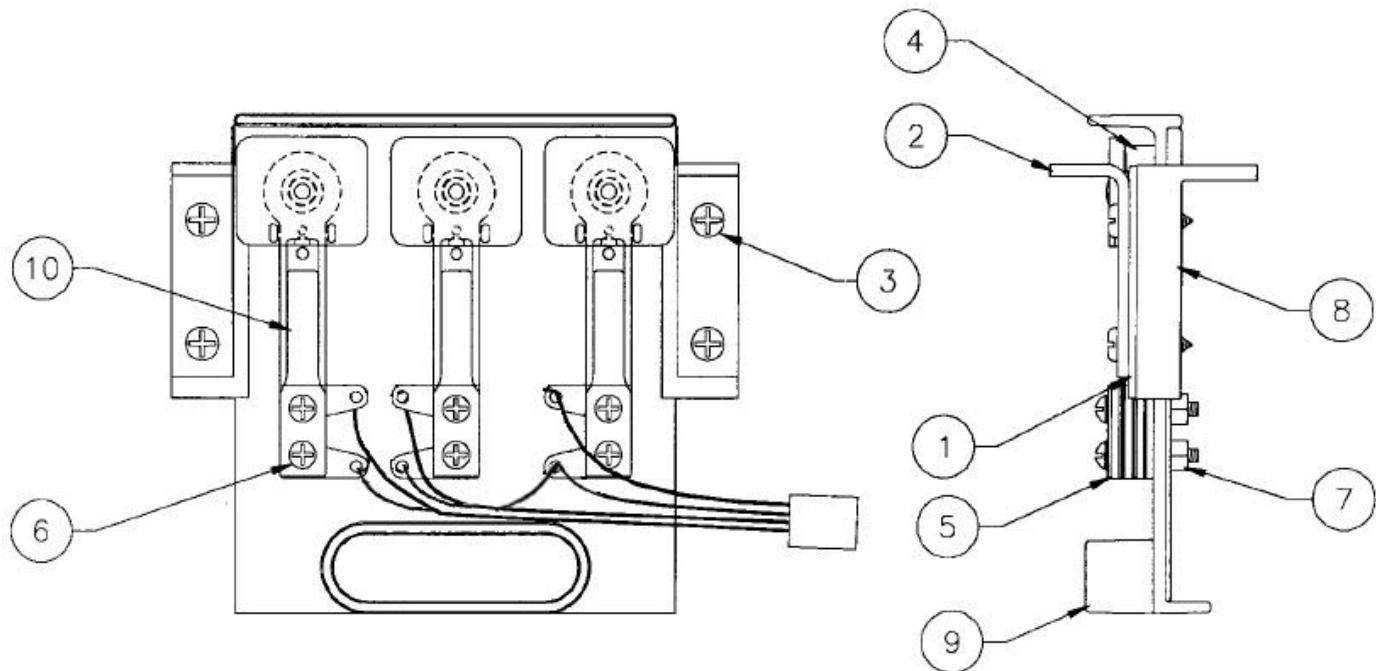
# AFM-SUB-A20572

## 3-Bank Motor Assembly



Item	Part Number	Description
1	04-10338.1	Motor Bracket Assembly
2	04-10278	3-Bank Lift Cam
3	14-8023	Motor
4	01-14289.1	Plastic Insulator
5	4002-01105-08	Mach. Screw, 2-56 x ½"
6	4010-01007-16	Mach. Screw, 10-32 x 1"
7	4010-01044-04	Mach. Screw, 10-32 x ¼"
8	4008-01083-04	Set Screw, 8-32 x ¼"
9	AFM-CBL-BNKUPDN	Motor Bank Up Down Cable
10	5647-12693-06	Sub-Miniature Switch
11	AFM-CBL-TARMOTR	Target Motor Cable

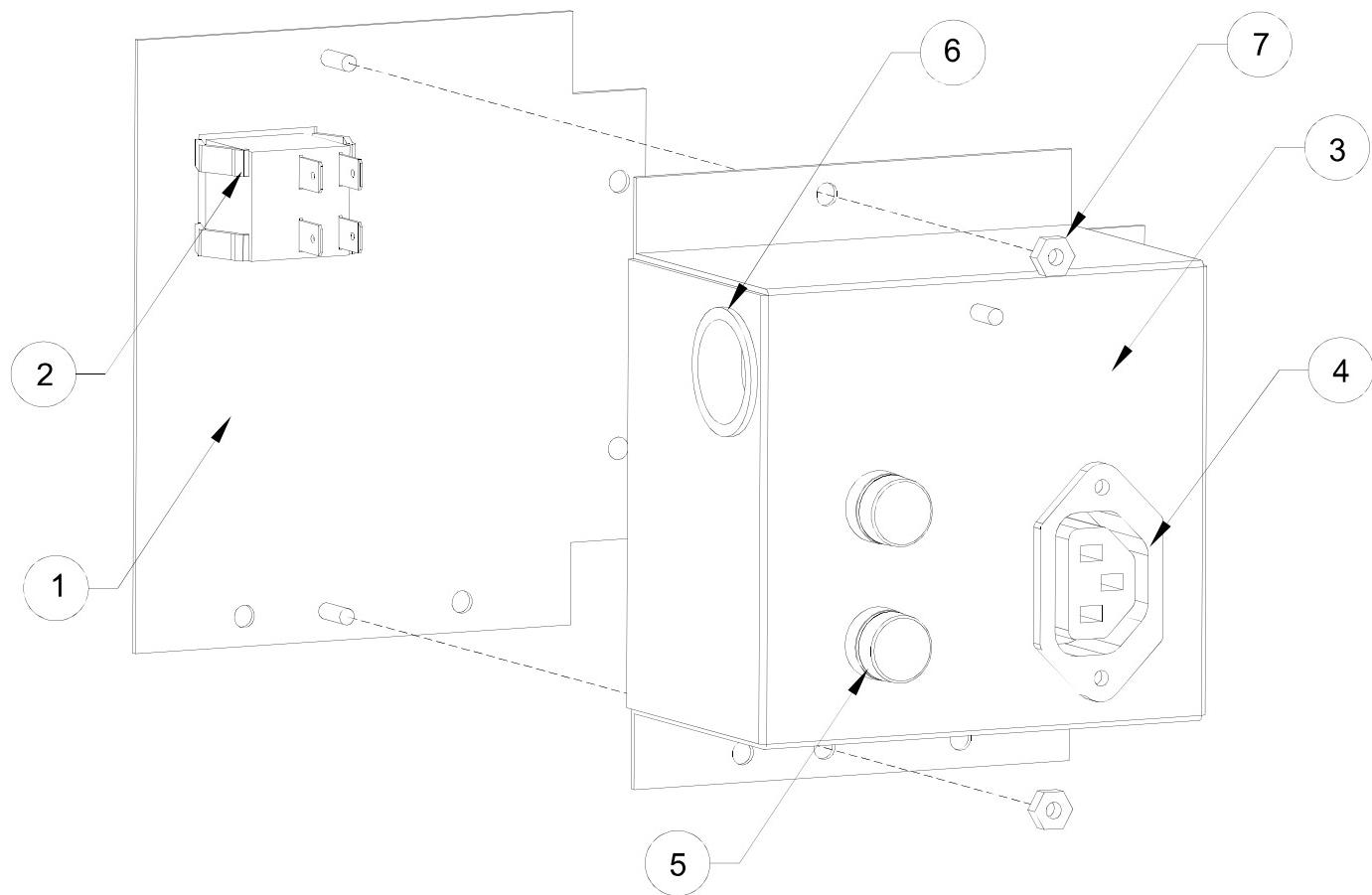
**AFM-SUB-A20683**  
**3-Bank Moving Target Assembly**



Item	Part Number	Description
1	03-8028	Retainer Carrier
2	01-8494	Support Bracket
3	4106-01001-10	Sh. Metal Screw, #6 x 5/8"
4	23-6534-9	Edge Protector
5	01-3670	Switch Plate – Curved
6	4004-01003-12	Mach. Screw, 4-40 x 3/4"
7	4404-01119-00	Nut 4-40 ESNA
8	03-8235	Target Guide
9	03-8236	Carrier Target
10	AFM-A-20833	3-Bank Target & Cable Assy.

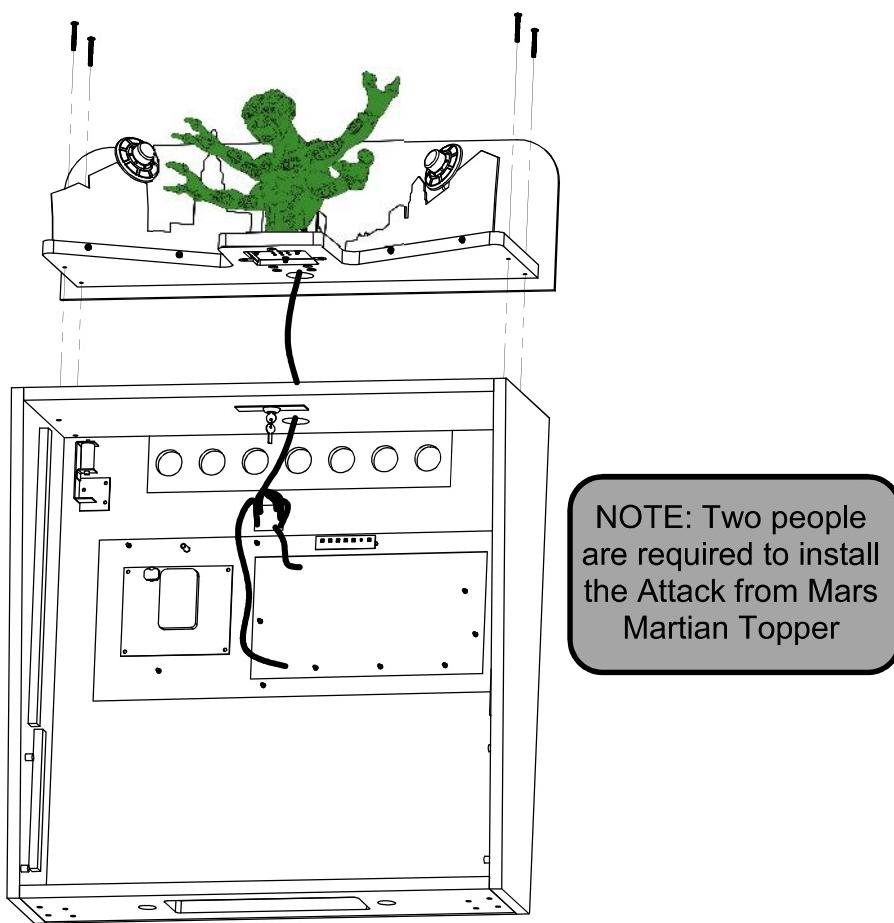
# PIN-SUB-POWRBOX

## Pinball Power Switch Fuse Box



Item	Part Number	Description
1	PIN-MLS-SWCHPLT	Power Switch Plate
2	000-SWC-ALCONOF	Alcoswitch Rocker, 16A DPST
3	PIN-MLS-SWCHBOX	Switch/Fuse Box
4	000-ELE-IECOUTL	IEC Outlet, Female
5	000-ELE-PNLFUSE	5mm Panel Mount Fuse Holder
6	000-PLM-100SBUS	1" Shorty Bushing
7	FNT-063-KEC0000	6-32 Kep Nut

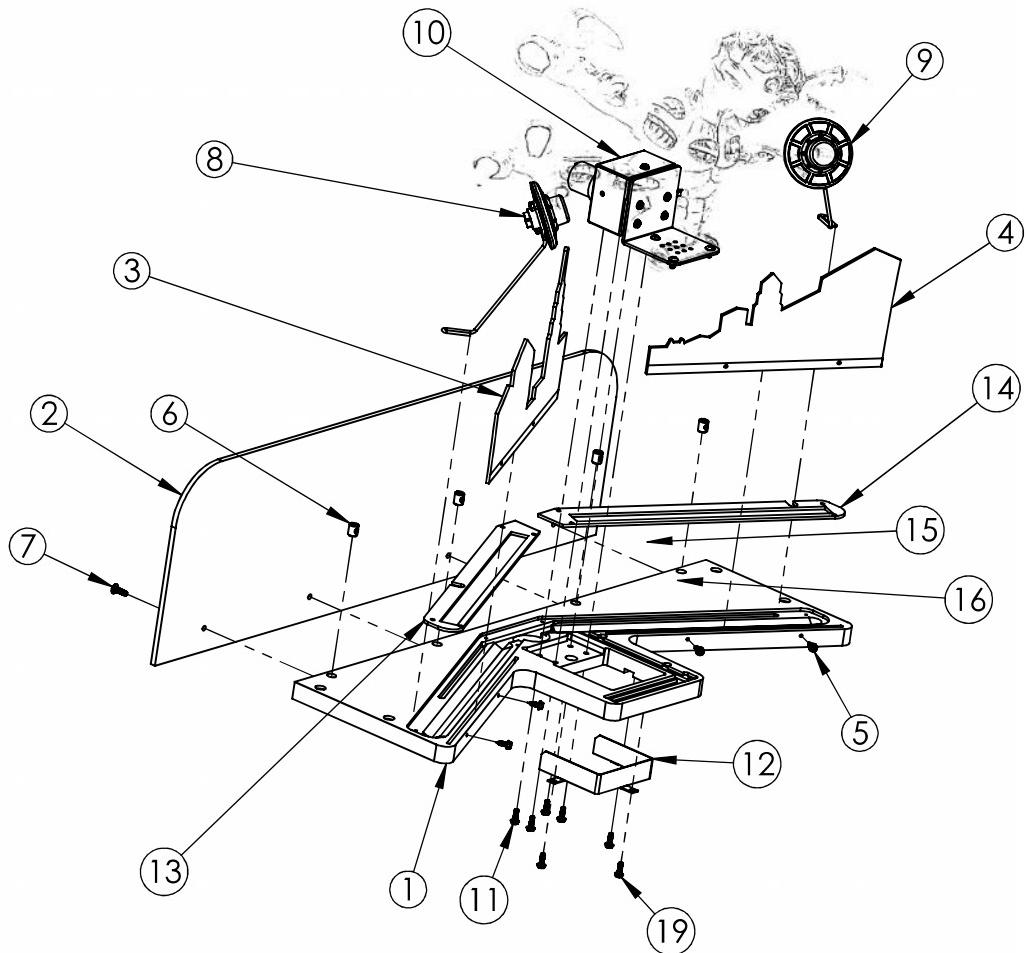
# Martian Topper Installation Instructions



- With the game powered off, remove the backglass/insert panel from the backbox. Unplug the insert panel and set to the side (see pg. 1-3 for instructions on removing insert panel).
- While one person holds the topper, the second person feeds the topper cables through the large hole in the top of the backbox.
- After the cables are pushed through, set the topper down flush against the top of the backbox, checking that the four mounting holes are aligned. Secure the topper to the backbox with the four mounting screws included in the topper kit.
- Connect the cables as they are labeled. Some cables plug into the Topper PCB, and others connect to other cables. Pay attention to the labels. Mating cables are marked so you know which to connect. Cables that plug in to the PCB are labeled with the connector on the board
- Power the game on, and hold SERVICE to enter the CGC SYSTEM MENU. Advance to the Topper Test menu, and make sure all components of the topper are functioning (see pg. 1-17 for information on the topper test).
- Re-install the insert panel in the backbox, and lock the backbox.

# AFM-SUB-MARTOPR

## Attack from Mars Martian Topper Assembly

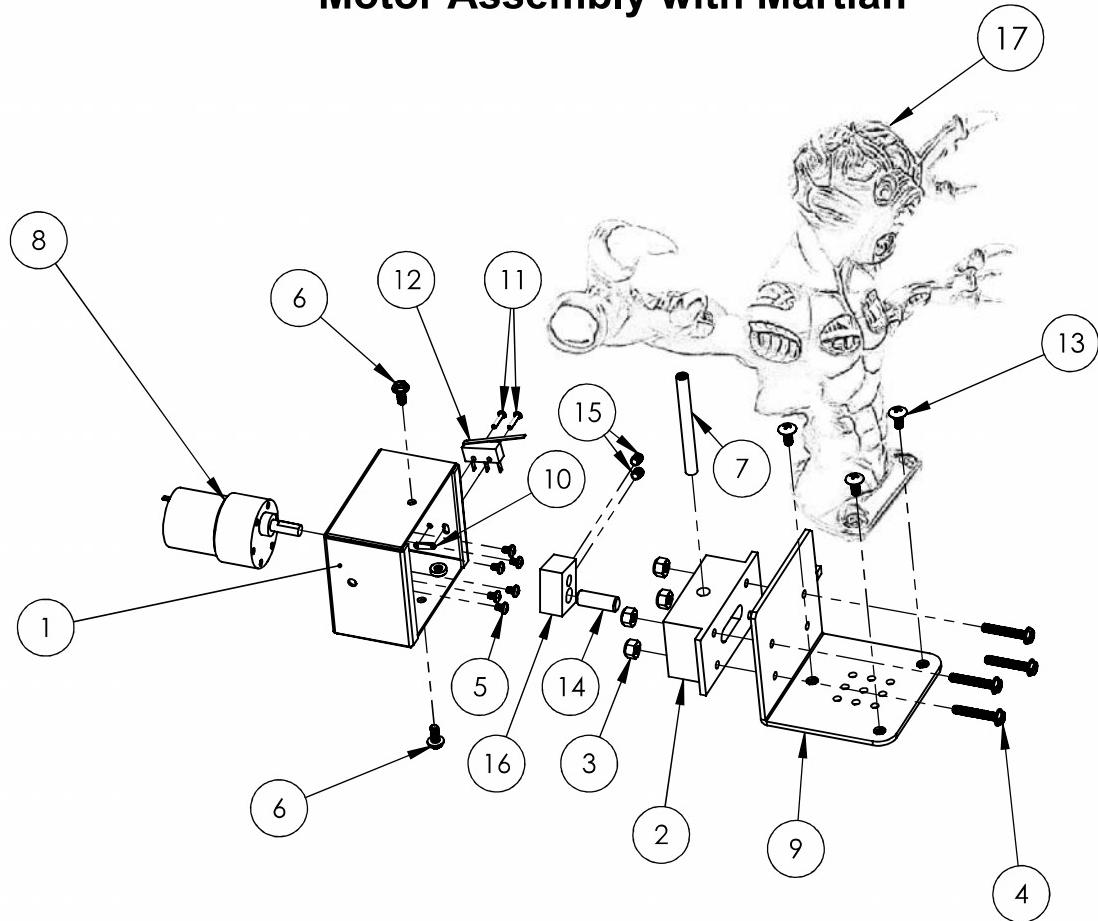


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	AFM-WMS-TOPRPLT	AFM Topper Plate, .75 MDF	1
2	AFM-ART-BAKGRND	Topper Background Art	1
3	AFM-ART-SKYLNLF	Topper City Skyline Left - .12	1
4	AFM-ART-SKYLNRT	Topper City Skyline Right - .12	1
5	FSS-N06-PPH050A	#6 x 1/2" Phil Pan Head Blk	4
6	FNT-102-CDN0539	Cross Dowel Nut, 1/2" Length,	4
7	FSM-102-ARH062A	10-24 x 5/8" Allen Round Head,	4
8	AFM-SUB-SAUCWRR	Topper Saucer Wire Assy - Left	1
9	AFM-SUB-SAUCWRL	Topper Saucer Wire Assy - Lef	1
10	AFM-SUB-MARTMTR	Motor Assembly with Martian	1
11	FSM-083-HWS050C	8-32 x 1/2" Hex Washer Head	4
12	AFM-MLS-MRFENCE	Martian Fence	1
13	AFM-ART-TPLENSL	AFM Topper Lamp Lens Left	1
14	AFM-ART-TPLENSR	AFM Topper Lamp Lens Right	1
15	AFM-ART-WIRECVR	AFM Topper Wire Cover	1
16	AFM-PLS-SPTLENS	AFM Topper Spotlight Lens	1

NOT SHOWN

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
17	--	RGB LED STRIP	2
18	FSM-N06-PPH032C	#6 x 5/16" Phil Pan Clear Zinc	12

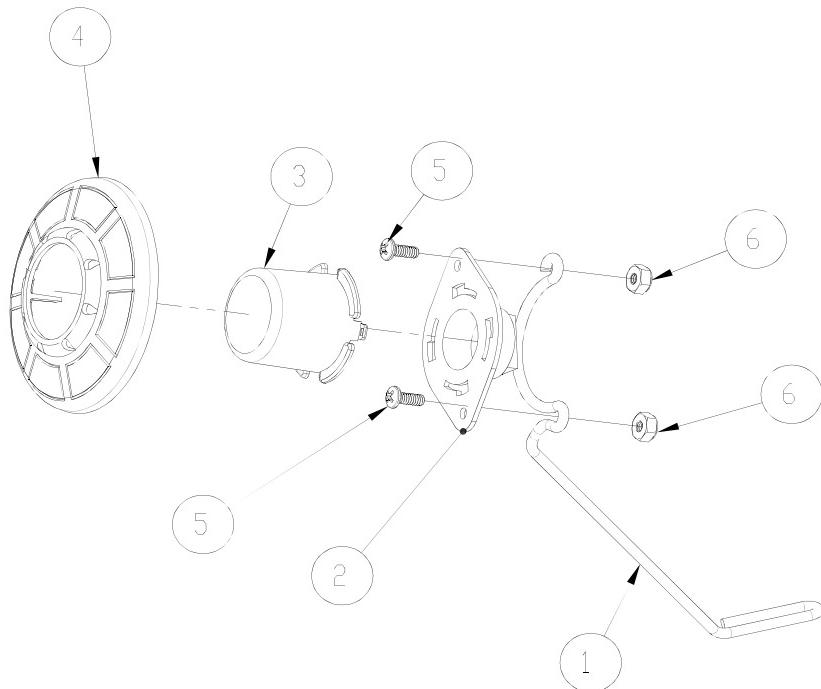
**AFM-SUB-MARTMTR**  
**Motor Assembly with Martian**



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	PIN-MLS-MOTRBOX	Martian Mech Motor Housing	1
2	AFM-PLC-CAMFLWR	Delrin Cam Follower	2
3	FNT-083-ESNa000	NUT, 8-32 ESNA/NTM clear ZINC	4
4	FSM-083-HWS100C	8-32 x 1" Hex Washer Head	4
5	FSM-M03-PFHM04C	M3 x 4mm Phillips Flat Head Clear Zinc	6
6	FSM-083-HWS037C	8-32 x 3/8" Hex Washer Head	2
7	FWC-083-025S250	8-32 Round Threaded Standoff,	1
8	PIN-MTR-SOG37A	HOTECH-HT-SOG37A	1
9	AFM-MLS-MARBRKT	Martian Bracket	1
10	PIN-01-8240	Nut Plate - #2-56	1
11	FSM-025-PPH050C	MS 2-56 x 1/2 P-PH-S ClearZinc	2
12	PIN-56471269311	Sw, SubMini DA3-QC w/Outhole	1
13	FSM-083-PTH037A	8-32 x 3/8" Phillips Truss Head	3
14	000-HDW-DP31X87	Dowel Pin, 5/16" Dia x 7/8" Long	1
15	FSM-103-ASF025S	10-32" x 1/4 Set Screw, Flat Point	2
16	AFM-MLM-MOTRCAM	Cam, 1" x 3/4" x 1/2" Steel	1
17	AFM-PLM-LGALIEN	Large Alien Figure - Topper	1

# AFM-SUB-SAUCWR/L

## Topper Saucer Wire Assy Left/Right



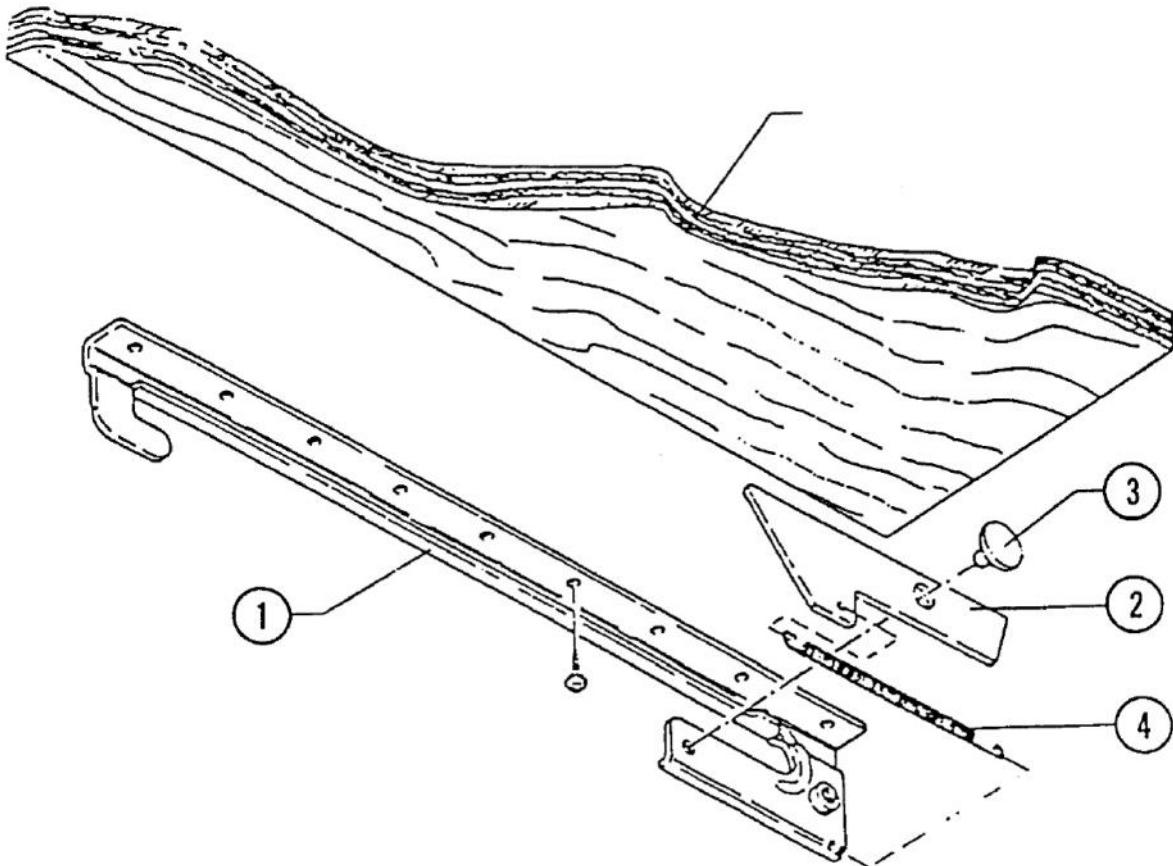
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	AFM-MWF-SWIRER/L	Saucer Wireform Left/ Right	1
2	PIN-03-8431	Receptacle Rivet	1
3	PIN-03-81719	Dome, Mini,TRP, Red,Twist Lock	1
4	AFM-03-9481M	Mini Saucer (Metallized) w/o	1
5	FSM-063-PPH037C	6-32 x 3/8" Phillips Pan Head	2
6	FNT-063-ESNA000	NUT 6-32 ESN clear zinc	2

MISCELLANEOUS PARTS (NOT SHOWN)

ITEM NO	PART NUMBER	DESCRIPTION	QTY.
7	AFM-SUB-SAUCTOP	Topper Mini Saucer LED Assembl	1
8	AFM-PCB-SAUCRTP	Topper Small Saucer RG LED PCB	1
9	000-CNR-S3BEH	3 Positions Header Connector O	1
10	000-CNR-2603403	3 Position Rectangular Housing	1
11	RIV-009-344000T	Rivet, .089 ID, 11/32" L, Roll	1
12	PIN-PCB-3PNFLSH	2-Pin Flasher PCB (For Twist L	1

# Playfield Slide Mechanism Assembly

(Left Assembly Shown)



**A-17749.1-1**  
**Playfield Slide Mechanism**  
(Left Assembly)

Item	Part Number	Description
1	01-12304-1	Slide, Left
2	01-10664.1	Lever Retainer
3	02-4615	Shoulder Rivet

**A-17749.1-2**  
**Playfield Slide Mechanism**  
(Right Assembly)

Item	Part Number	Description
1	01-12304-1	Slide, Right
2	01-10664.1	Lever Retainer
3	02-4615	Shoulder Rivet

**Associated Part:**

4      10-439      Spring

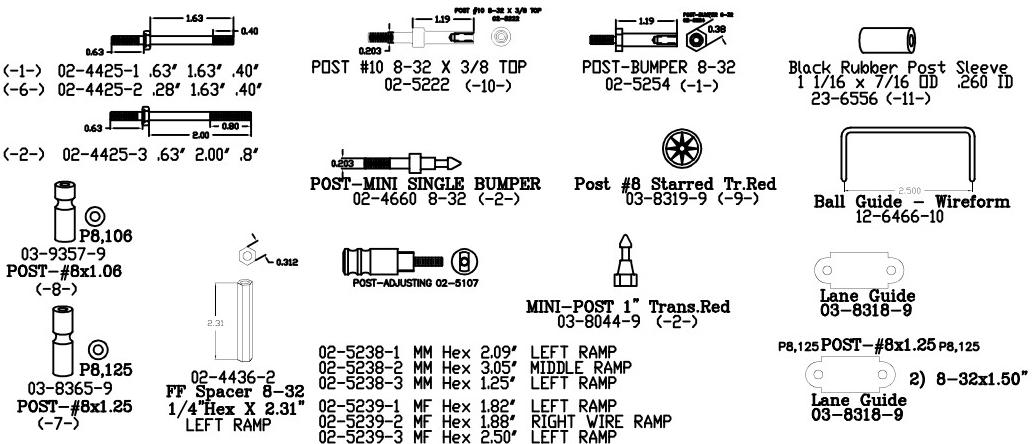
**Associated Part:**

4      10-439      Spring

## Posts

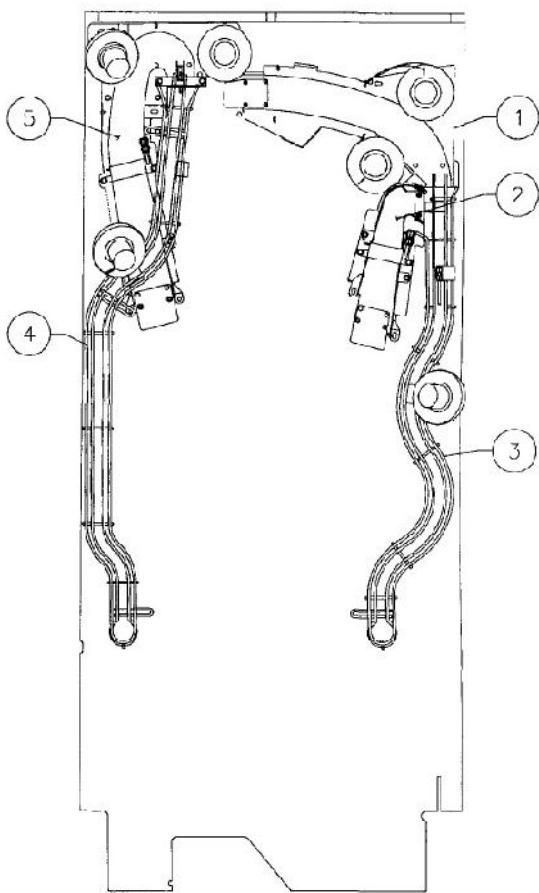
Part Number	Description.
02-4425-1	Post Fastner 8-32
02-4425-2	Post Fastner 8-32
02-4425-3	Post Fastner 8-32
02-4436-2	F-F Spacer 8-32
02-4660	Single Bumper Post
02-5107	Adjusting Post
02-5222	Post #10, 8-32
02-5254	Post 8-32 Bumper
03-8044-9	Mini Post Trans.
03-8319-9	Red Post #8 Trans.
03-8365-9	Red Post #8 Trans.
03-9357-9	Red Post #8 x 1.06"

### Ball Guides & Posts Attack From Mars PLAYFIELD Top



## RAMPS

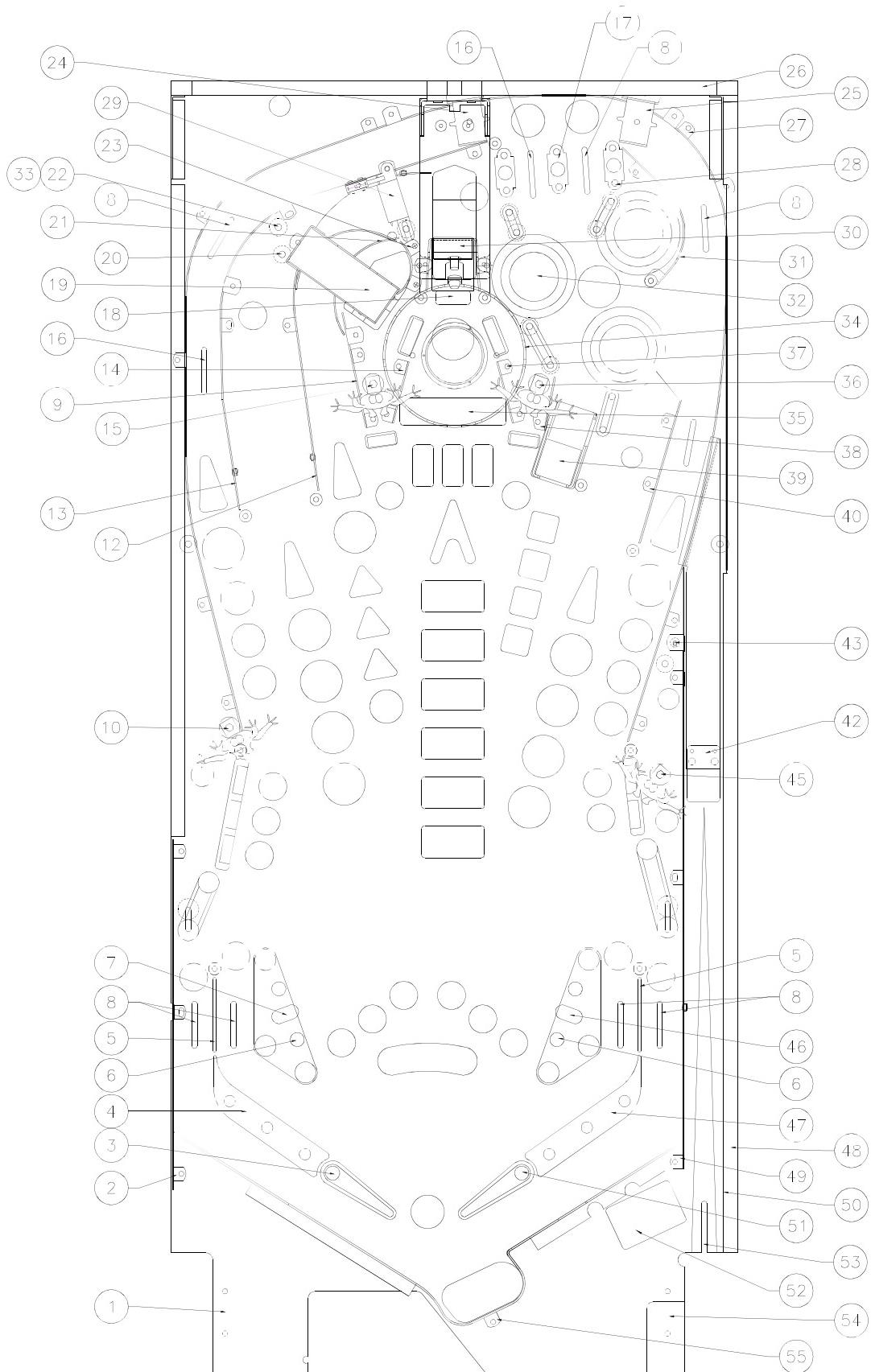
Item	Part Number	Description
1	04-10279.1	Weldment Right Popper
2	AE-25-1000	Coil Assembly
3	03-7067	Coil Tubing
4	10-135	Solenoid Spring
5	23-6420	Rubber Grommet
6	04-10086.1	Mouting Bracket
7	A-17767	Bell Armature Assembly
8	4408-01119-00	Nut, 8-32 ESN
9	4106-01013-06	Sh. Metal Screw, #6 x 3/8"
10	PIN-A-16908	LED Assembly, RTV
11	PIN-A-16909	Photo Trans. Assy, RTV
12	AFM-CBL-OPTOSW	Opto Switch Cable
13	PIN-CBL-COILOV	2-Pin Coil Cable – Orange Violet



## UPPER PLAYFIELD PARTS

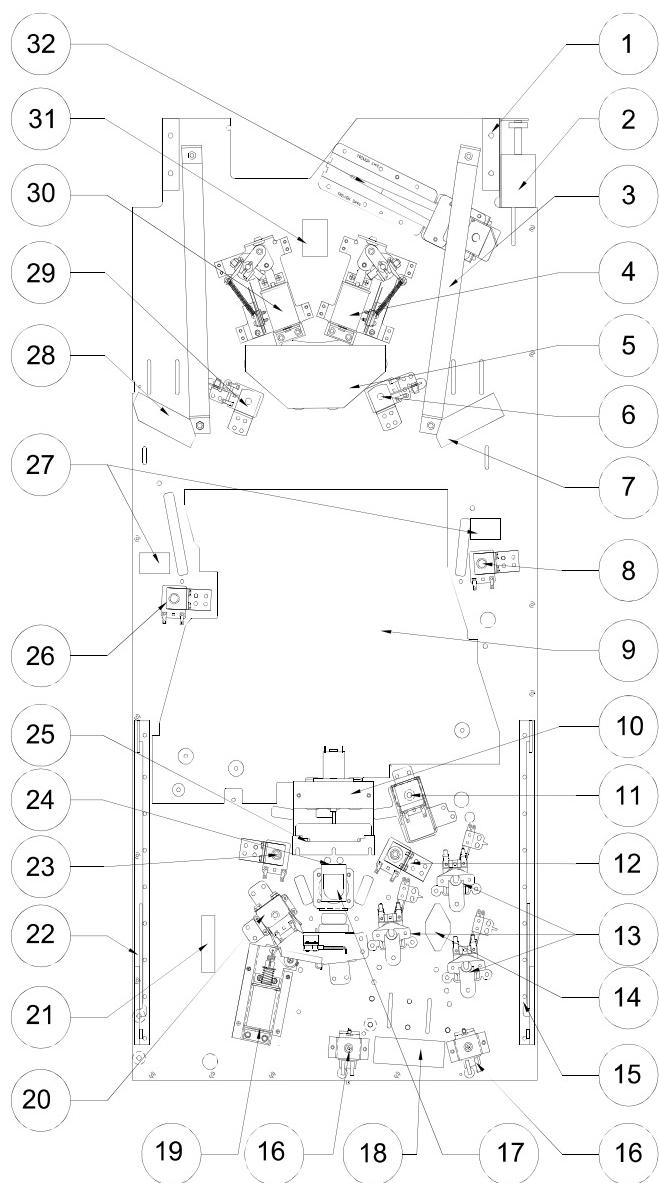
Item No.	Part Number	Description	Item No.	Part Number	Description
1	01-9211	Playfield Hanger Bracket (2)	35	A-20572	3-Bank Motor Assembly
2	01-12915	Ball Guide		A-20683	Moving Target Assembly
3	A-15849-L-2	Flipper Assembly Complete		02-4259	Roller
	20-10110-5	Flipper Bat & Shaft Assembly	36	A-20579-1	Alien Mech. Assembly
4	A-20570-2	Left Flipper Ball Guide		01-14173.1	Figurine Support Bracket
5	12-6466-10	Ball Guide Wire 2 1/2"		23-6768	Alien Figurine
6	A-17801	Kicker Count Switch Assembly	37	01-14269	Ball Guide
7	A-17811	Kicker Assembly	38	01-14111	Ball Guide
	B-9362-L-2	Coil & Bracket assembly	39	A-20573	Right Ball Popper Assembly
	10-128	Spring	40	01-14192	Ball Guide
8	A-17813	Rollover Switch Assembly	42	A-20480	Ball Guide Ramp Assembly
9	04-10274.2	Ball Guide	43	02-5239-1	Standoff 1.82"
10	A-20579-1	Alien Mech. Assembly	45	A-20579-1	Alien Mech. Assembly
	01-14169.2	Figurine Support Bracket		01-14171.2	Figurine Support Bracket
	23-6768	Alien Figurine		23-6768	Alien Figurine
12	04-10272	Ball Guide	46	A-17811	Kicker Assembly
13	04-10271	Ball Guide		B-9362-R-3	Coil & Bracket Assembly
14	01-14269	Ball Guide		10-128	Spring
15	A-20479-2	Alien Mech. Assembly	47	A-20570-1	Right Flipper Ball Guide
	01-14170.1	Figurine Support Bracket	48	A-15802-P	Level
	23-6768	Alien Figurine	49	04-10275	Ball Guide
16	A-17813-1	Rollover Switch Assembly	50	01-10621	Strike Plate
17	03-8318-9	Double Sided Lite Hood, Red (3)	51	A-15849-R-2	Flipper Assembly Complete
18	A-20657	1-Bank Drop Target Assembly		20-10110-5	Flipper Bat & Shaft Assembly
19	A-20633	Left Popper Assembly	52	A-19963-1	Ball Trough w/Cable
	04-10296	Left Popper Scoop	53	A-18973	Shooter Lane Switch
20	02-4436-2	Spacer 2.31"	54	A-14525	Kicker Bracket Assembly
	02-5238-1	Standoff 2.09"	55	01-13593	Bottom Arch Ball Guide
21	A-17241	Ramp Diverter Assembly			
	A-20556	Shaft & Blade Assembly			
	20-10283	Bearing			
	4700-00030-00	Flat Washer			
22	01-14242.1	Angle Bracket			
	02-5238-2	Standoff 3.05"			
23	01-14193	Ball Guide			
24	A-17796	Ball Gate Actuator Coil Assy.			
	A-17797-2	Right Ball Gate Assembly			
	03-7796-2	Target Shaft Washer			
25	A-17796	Ball Gate Actuator Coil Assy.			
	A-17797-1	Left Ball Gate Assembly			
	03-7796-2	Target Shaft Washer			
26	AFM-SUB-A20578	Back Panel Assembly			
27	04-10270.1	Ball Guide			
28	02-5239-2	Standoff 1.88"			
29	A-20755	Ball Gate Assembly			
30	A-20658	Trough Assembly			
	01-14110	Ball Guide			
31	01-14112	Ball Guide			
32	A-9415-2	Jet Bumper Coil Assembly			
	A-12030-3	Jet Bumper Switch Assembly			
	B-9414-3	Jet Bumper Wafer Assy., Red			
	03-9007-9	Jet Bumper Cap, Red			
	23-6710-1	Clear Tubing #10 1"			
33	01-14284	Scoop Hang-up Bracket			
34	AFM-SUB-A20608	Saucer Assembly			
<b>NOT SHOWN:</b>					
				A-13204-50041	Bottom Arch Assembly
				A-17812-2	Cable Mounting Bracket 1/2"
				A-17812-4	Cable Mounting Bracket 1"
				A-20546	Left Wire Ramp Assembly
				A-20547	Right Plastic Ramp Assembly
				A-20549	Right Wire Ramp Assembly
				A-20553	Left Plastic Ramp Assembly
				A-20621	Middle Plastic Ramp Assembly
				A-20771-1	Playfield Plastic Assembly
				A-20771-2	Playfield Plastic Assembly
				A-20771-3	Playfield Plastic Assembly
				A-20771-4	Playfield Plastic Assembly
				A-20771-5	Playfield Plastic Assembly
				AFM-PLS-JETMYLR	Jet Bumper Mylar
				PIN-PLS-RTNMYLR	Ramp Drop Area Mylar
				AFM-PLS-SOLMYLR	Stroke of Luck Mylar
				AFM-PLS-3BNKMLR	3-Bank Target Mylar
				AFM-50041-PL	Screened Playfield

## UPPER PLAYFIELD PARTS

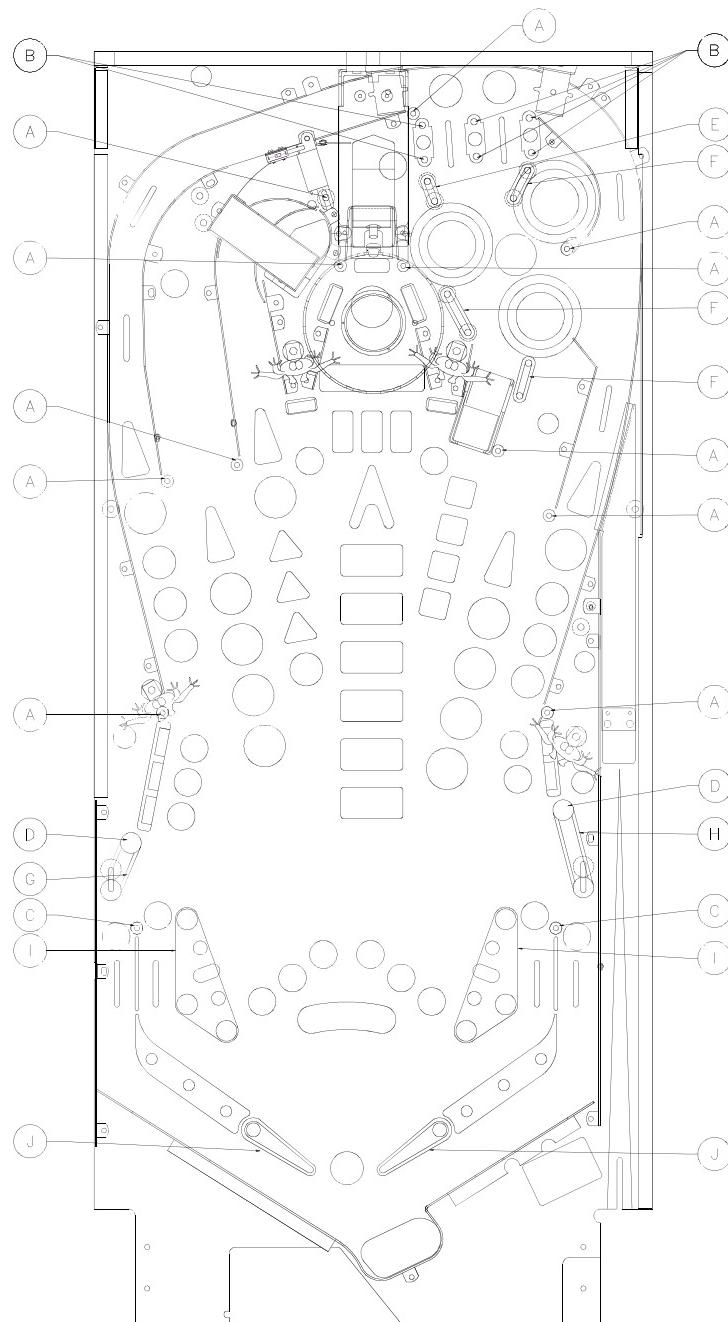


## LOWER PLAYFIELD PARTS

<b>Item</b>	<b>Part Number</b>	<b>Description</b>
1	01-9211	Bracket Playfield Hanger (2)
2	PIN-SUB-A14525	Shooter Lane Kicker Bracket Assy.
3	01-11781	Leg Support (2)
4	PIN-A-15849R2	Flipper Assembly
5	AFM-PCB-7LAMP	7 Lamp PCB
6	PIN-SUB-A17811	Kicker Arm (Slingshot) Assy.
	PIN-B-9362R3	Coil & Bracket Assembly
7	AFM-PCB-LAMP85	Playfield LED L84 & L85
8	AFM-SUB-A205791	Alien Mech. Assembly
	01-14171.2	Figurine Support Bracket
9	AFM-PCB-PLAYFLD	AFM Playfield PCB
10	AFM-SUB-A20572	3-Bank Motor Assembly
11	AFM-SUB-A20573	Right Ball Popper Assembly
12	AFM-SUB-A205791	Alien Mech. Assembly
	01-14173.1	Figurine Support Bracket
13	PIN-SUB-A94152	Jet Bumper Coil Assembly
14	AFM-PCB-MARFLSH	Jet Bumper Flasher
15	A-17749.1-2	Playfield Slide Mechanism, R.
16	PIN-SUB-A177961	Ball Gate Actuator Assy. (2)
17	AFM-SUB-A20657	1-Bank Drop Target Assembly
18	AFM-PCB-L43L44	Playfield LED L43 and L44
19	PIN-SUB-A17241	Ramp Diverter Assembly
20	AFM-SUB-A20633	Left Popper Assembly
	04-10296	Left Popper Scoop
21	AFM-PCB-SAUCNT	Mini-Saucer PCB Connector Board
22	A-17749.1-1	Playfield Slide Mechanism, L.
23	AFM-SUB-A205792	Alien Mech. Assembly
	01-14170.1	Figurine Support Bracket
24	AFM-PCB-LAMP18	Playfield LED L18
25	AFM-SUB-A20683	3-Bank Moving Target Assembly
26	AFM-SUB-A205791	Alien Mech. Assembly
	01-14169.2	Figurine Support Bracket
27	PIN-PCB-TRUFLSH	Through Playfield Flasher
28	AFM-PCB-L8283	Playfield LED L82 and L83
29	PIN-SUB-A17811	Kicker Arm (Slingshot) Assy.
	PIN-B-9362L2	Coil & Bracket Assembly
30	PIN-A-15849L2	Flipper Assembly
31	AFM-PCB-LAMP81	Playfield LED L81
	PIN-SUB-A199631	Ball Trough Assembly



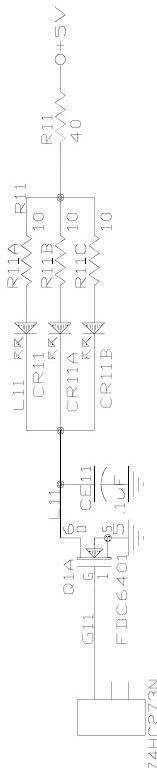
## RUBBER RINGS



Item No.	Part Number	Description.	Qty	Item No.	Part Number	Description.	Qty
A	23-6556	Black Sleeve	11	F	23-6694-5	Ring ¾", Black	3
B	23-6641	Bumper Rubber, Black	6	G	23-6694-6	Ring 1", Black	1
C	23-6694-1	Grommet 3/32", Black	2	H	23-6694-7	Ring 1 ¼", Black	1
D	23-6694-3	Ring 5/16", Black	2	I	23-6694-10	Ring 2 ½", Black	2
E	23-6694-4	Ring 7/16", Black	1	J	23-6695	Flipper Ring, Black	2

Attack From Mars									
Lamp Table (NOT A MATRIX) Cabinet lamp drivers are on the CONTROLLER Board									
L11 Q1A	L21 Q6B	L31 Q10B	L41 Q15A	L51 Q24A	L61 Q28B	L71 Q32A	L81 Q35A		
SUPER JETS	BIG-O-BEAM 1	TRACTOR BEAM 1	RIGHT LOOP ARROW	ATTACK MARS	FRANCOIS D'GRIMM	CAPTURE 1	SHOOT AGAIN J16p4		
L12 Q1B	L22 Q6A	L32 Q11A	L42 Q13B	L52 Q24B	L62 Q29A	L72 Q33B	L82 Q36B		
SUPER JACKPOT	BIG-O-BEAM 2	TRACTOR BEAM 2	CENTER RAMP ARROW	D.C. USA	KING OF PAYNE	CAPTURE 2	LEFT OUTLANE J16p3		
L13 Q2A	L23 Q5B	L33 Q11B	L43 Q16A	L53 Q25A	L63 Q29B	L73 Q33A	L83 Q36A		
MARTIAN ATTACK MULTIBALL	BIG-O-BEAM 3	TRACTOR BEAM 3	LEFT TOP LANE	LONDON ENGLAND	EARL OF EGO	CAPTURE 3	LEFT RETURN J16p2		
L14 Q2B	L24 Q5A	L34 Q12A	L44 Q16B	L54 Q23B	L64 Q30A	L74 Q34B	L84 Q38A		
ANNIHILATION	LEFT RAMP JACKPOT	RIGHT RAMP JACKPOT	RIGHT TOP LANE	LIGHT LOCK	LFT RAMP JACKPOT	LEFT LOOP JACKPOT PL91	RIGHT RETURN J10p9		
L15 Q3A CR15	L25 Q7A	L35 Q12B	L45 Q14B	L55 Q23A	L65 Q30B	L75 Q34A	L85 Q38B		
RETURN TO BATTLE	LEFT RAMP ARROW	RIGHT RAMP ARROW	LEFT MOTOR BANK	LOCK 1 +J8p1 J8p4	REVOLTING PEASANTS!	LEFT LOOP ARROW	RIGHT OUTLANE		
L16 Q3B	L26 Q7B	L36 Q9B	L46 Q14A	L56 Q25B	L66 Q28A	L76 Q31B	L86 Q2A		
CONQUER MARS	LOCK 2	MARTIAN ATTACK	CENTER MOTOR BANK	PISA ITALY +J8p2 J8p3	RIGHT LOOP JACKPOT	'M'ARTIAN TARGET	LAUNCH BUTTON J2p13		
L17 Q4A	L27 Q8A	L37 Q10A	L47 Q15B	L57 Q26A	L67 Q27B	L77 Q31A	L87		
5-WAY COMBO	LOCK 3	RULE UNIVERSE	RIGHT MOTOR BANK	BERLIN GERMANY	EXTRA BALL	M'A'RTIAN TARGET	NOT USED		
L18 Q4B	L28 Q8B	L38 Q9A	L48 Q13A	L58 Q26B	L68 Q27A	L78 Q32B	L88 Q1B		
DROP TARGET	CENTER RAMP JACKPOT	STROKE OF LUCK	MAR'T'IAN TARGET	PARIS FRANCE	MART'I'AN TARGET	MAR'T'IAN TARGET J6p8	START BUTTON J2p12		
GI LED#	PF Left	GI1 P93	BROWN WHT-BRN	GI2 P94	ORANGE WHT-ORG	GI3 P95	YELLOW WHT-YEL		
SOCKET#	PF Right	Q42A		Q42B		Q43A			

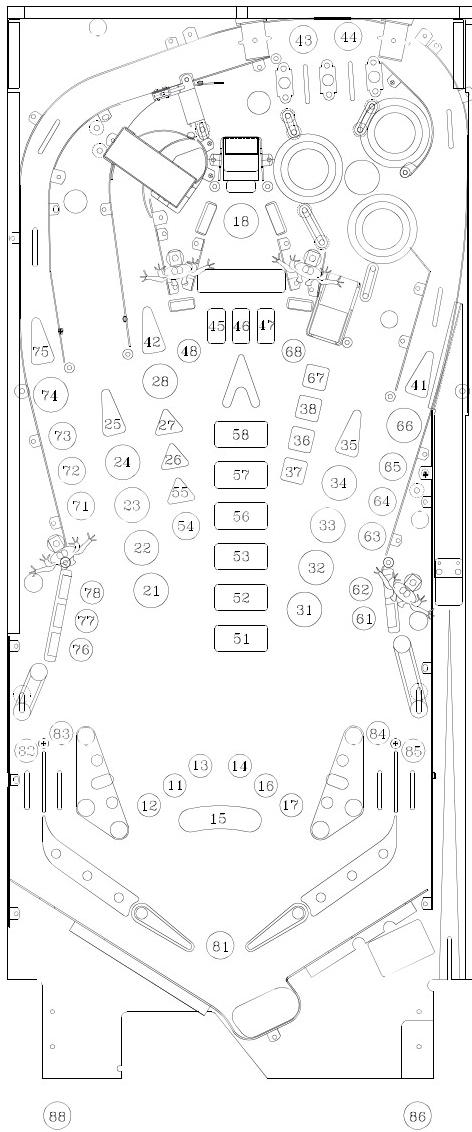
Typical Lamp circuit



## LAMP LOCATIONS

Item No.	Lamp Assy. No.	Description	Item No.	Lamp Assy. No.	Description
11	AFM-PCB-7LAMP	Super Jets	35	AFM-PCB-PLAYFLD	Right Ramp Arrow
12	AFM-PCB-7LAMP	Super Jackpot	36	AFM-PCB-PLAYFLD	Martian Attack
13	AFM-PCB-7LAMP	Martian Attack Multi-ball	37	AFM-PCB-PLAYFLD	Rule Universe
14	AFM-PCB-7LAMP	Annihilation	38	AFM-PCB-PLAYFLD	Stroke Of Luck
15	AFM-PCB-7LAMP	Return To Battle	41	AFM-PCB-PLAYFLD	Right Loop Arrow
16	AFM-PCB-7LAMP	Conquer Mars	42	AFM-PCB-PLAYFLD	Center Ramp Arrow
17	AFM-PCB-7LAMP	5-Way Combo	43	AFM-PCB-L4344	Left Top Lane
18	AFM-PCB-LAMP18	Drop Target	44	AFM-PCB-L4344	Right Top Lane
21	AFM-PCB-PLAYFLD	Big-O-Beam 1	45	AFM-PCB-PLAYFLD	Left Motor Bank
22	AFM-PCB-PLAYFLD	Big-O-Beam 2	46	AFM-PCB-PLAYFLD	Center Motor Bank
23	AFM-PCB-PLAYFLD	Big-O-Beam 3	47	AFM-PCB-PLAYFLD	Right Motor Bank
24	AFM-PCB-PLAYFLD	Left Ramp Jackpot	48	AFM-PCB-PLAYFLD	MAR'T'IAN Target
25	AFM-PCB-PLAYFLD	Left Ramp Arrow	51	AFM-PCB-PLAYFLD	Attack Mars
26	AFM-PCB-PLAYFLD	Lock 2	52	AFM-PCB-PLAYFLD	D.C., U.S.A.
27	AFM-PCB-PLAYFLD	Lock 3	53	AFM-PCB-PLAYFLD	London, England
28	AFM-PCB-PLAYFLD	Center Ramp Jackpot	54	AFM-PCB-PLAYFLD	Light Lock
31	AFM-PCB-PLAYFLD	Tractor Beam 1	55	AFM-PCB-PLAYFLD	Lock 1
32	AFM-PCB-PLAYFLD	Tractor Beam 2	56	AFM-PCB-PLAYFLD	Pisa, Italy
33	AFM-PCB-PLAYFLD	Tractor Beam 3	57	AFM-PCB-PLAYFLD	Berlin, Germany
34	AFM-PCB-PLAYFLD	Right Ramp Jackpot	58	AFM-PCB-PLAYFLD	Paris, France

## LAMP LOCATIONS CONTINUED



<b>Item No.</b>	<b>Lamp Assy. No.</b>	<b>Description</b>	<b>Item No.</b>	<b>Lamp Assy. No.</b>	<b>Description</b>
61	AFM-PCB-PLAYFLD	MARTIA"N" Target	77	AFM-PCB-PLAYFLD	M"A"RTIAN Target
62	AFM-PCB-PLAYFLD	MARTI"A"N Target	78	AFM-PCB-PLAYFLD	MA"R"TIAN Target
63	AFM-PCB-PLAYFLD	Atomic Blaster 1	81	AFM-PCB-LAMP81	Shoot Again
64	AFM-PCB-PLAYFLD	Atomic Blaster 2	82	AFM-PCB-L8283	Left Outlane
65	AFM-PCB-PLAYFLD	Atomic Blaster 3	83	AFM-PCB-L8283	Left Return
66	AFM-PCB-PLAYFLD	Right Loop Jackpot	84	AFM-PCB-L8485	Right Return
67	AFM-PCB-PLAYFLD	Extra Ball	85	AFM-L8485	Right Outlane
68	AFM-PCB-PLAYFLD	MART"I"AN Target	86	20-9663-B-4	Launch Button
71	AFM-PCB-PLAYFLD	Capture 1	87	---	Not Used
72	AFM-PCB-PLAYFLD	Capture 2	88	20-9663-2	Start Button
73	AFM-PCB-PLAYFLD	Capture 3			
74	AFM-PCB-PLAYFLD	Left Loop Jackpot			
75	AFM-PCB-PLAYFLD	Left Loop Arrow			
76	AFM-PCB-PLAYFLD	"M"ARTIAN Target			

Attack From Mars									
Switch Table (NOT A MATRIX)		Cabinet switches are read by CONTROLLER Board							
LEFT COIN J3p11 D1	LAUNCH BALL J2p9 U3p3	NOT USED 11	TROUGH EJECT JS31p8 U13p2	MARTI'A'N TARGET JS54 U15p5	LEFT SLINGSHOT J16p8 U12p4	LEFT RAMP ENTER J5p1 U16p2	RIGHT LOOP HIGH J8p9 U17p2	LOW RT FLIP EOS J10p6 U15p2	F1
CENTER COIN J3p10 D2	NOT USED J2p7 --	COIN DOOR CLOSED 22	TROUGH BALL 1 JS31p7 U13p3	MARTIA'N TARGET JS55 U15p6	RIGHT SLINGSHOT J10p2 U12p6	CENTER RAMP ENTER J8p5 U17p5	RIGHT LOOP LOW J8p8 U17p3	LOW RT FLIP OPTO J2p5 U3p7	F2
RIGHT COIN J3p9 D3	START BUTTON J2p10 U3p2	NOT USED 13	TROUGH BALL 2 JS31p6 U13p4	MAR'TIAN TARGET JS43p1 U14p4	LEFT JET J7p1 U15p9	RIGHT RAMP ENTER J8p7 U17p4	LEFT LOOP HIGH J6p4 U16p4	LOW LF FLIP EOS J16p10 U12p2	F3
NOT USED D4	PLUMB BOB TILT J2p8 U3p4	ALWAYS CLOSED 14	TROUGH BALL 3 JS31p4 U13p5	MARTI'A'N TARGET JS43p1 U14p4	BOTTO M JET J7p3 U13p7	LEFT RAMP EXIT J5p2 U16p3	LEFT LOOP LOW J6p3 U16p5	LOW LF FLIP OPTO J2p6 U3p6	F4
ESCAPE SVC CRDT J3p7 D5	NOT USED --	NOT USED 25	TROUGH BALL 4 JS31p3 U13p6	LEFT MOTOR BANK JS45p1 U14p6	RIGHT JET J7p4 U13p8	RIGHT RAMP EXIT J12p1 U17p9	LEFT SAUCER TARGET J6p2 U16p6	UP RT FLIP EOS Not Used	F5
VOLUME DOWN J3p5 D6	LEFT OUTLANE J16p9 U12p3	LF RETURN LANE J16p7 U12p5	LEFT POPPER JS36p5 U10p3	CENTER MOTOR BANK JS45p2 U14p7	'M'ARTIAN TARGET JS26p1 U12p7	MOTOR BANK DOWN JS41p1 U14p2	RIGHT SAUCER TARGET J8p3 U17p7	UP RT FLIP OPTO J2p3 U3p9	F6
VOLUME UP J3p4 D7	RT RETURN LANE J10p5 U15p3	RIGHT OUTLANE J10p3 U15p7	RIGHT POPPER JS37p5 U16p9	RIGHT MOTOR BANK JS45p3 U14p8	M'A'RTIAN TARGET JS27p1 U12p8	MOTOR BANK UP JS41p2 U14p3	DROP TARGET J8p2 U17p8	NOT USED	F7
BEGIN TEST J3p3 D8	SHOOTER LANE J10p4 U15p4	NOT USED 18	LEFT TOP LANE J7p5 U15p8	RIGHT TOP LANE J8p10 U14p9	MAR'TIAN TARGET JS67 U12p9	NOT USED 58	CENTER TROUGH J8p11 U16p8	UP LFT FLIP OPTO J2p4 U3p8	F8

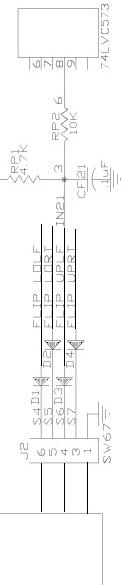
= Opto, Typically Closed

## SWITCH LOCATIONS

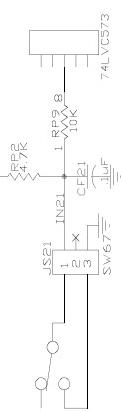
Item No.	Switch Part No.	Description	Item No.	Switch Part No.	Description
F1	SW-1A-194	Lower Right Flipper EOS	31	A-18617-1	Trough Eject (LED)
F2	A-17316	*Lower Right Flipper Cabinet	31	A-18618-1	(Transistor)
F3	SW-1A-194	Lower Left Flipper EOS	32	A-18617-1	Trough Ball 1 (LED)
F4	A-17316	*Lower Left Flipper Cabinet	32	A-18618-1	(Transistor)
F5	--	Not Used	33	A-18617-1	Trough Ball 2 (LED)
F6	--	Not Used	33	A-18618-1	(Transistor)
F7	--	Not Used	34	A-18617-1	Trough Ball 3 (LED)
F8	--	Not Used	34	A-18618-1	(Transistor)
11	20-9663-B-4	Launch Button	35	A-18617-1	Trough Ball 4 (LED)
12	--	Not Used	35	A-18618-1	(Transistor)
13	20-9663-2	Start Button	36	A-16908	Left Popper (LED)
14	04-10346	*Plumb Bob Tilt	36	A-16909	(Transistor)
15	--	Not Used	37	A-16908	Right Popper (LED)
16	5647-12693-19	Left Outlane	37	A-16909	(Transistor)
17	5647-12693-19	Right Return	38	5647-12693-19	Left Top Lane
18	5647-12693-32	Shooter Lane	41	A-18018-21	MARTI'A'N Target
21	--	*Slam Tilt	42	A-18018-21	MARTIA'N Target
22	5643-09288-00	*Coin Door Closed	43	A-18018-21	MAR'T'IAN Target
23	--	Not Used	44	A-18018-21	MART'I'AN Target
24	5643-09112-00	*Always Closed	45	SW-1A-201-4	Left Motor Bank
25	--	Not Used	46	SW-1A-200-4	Center Motor Bank
26	5647-12693-19	Left Return	47	SW-1A-200-4	Right Motor Bank
27	5647-12693-19	Right Outlane	48	5647-12693-19	Right Top Lane
28	--	Not Used			

\*Not Shown

† Located Under Playfield

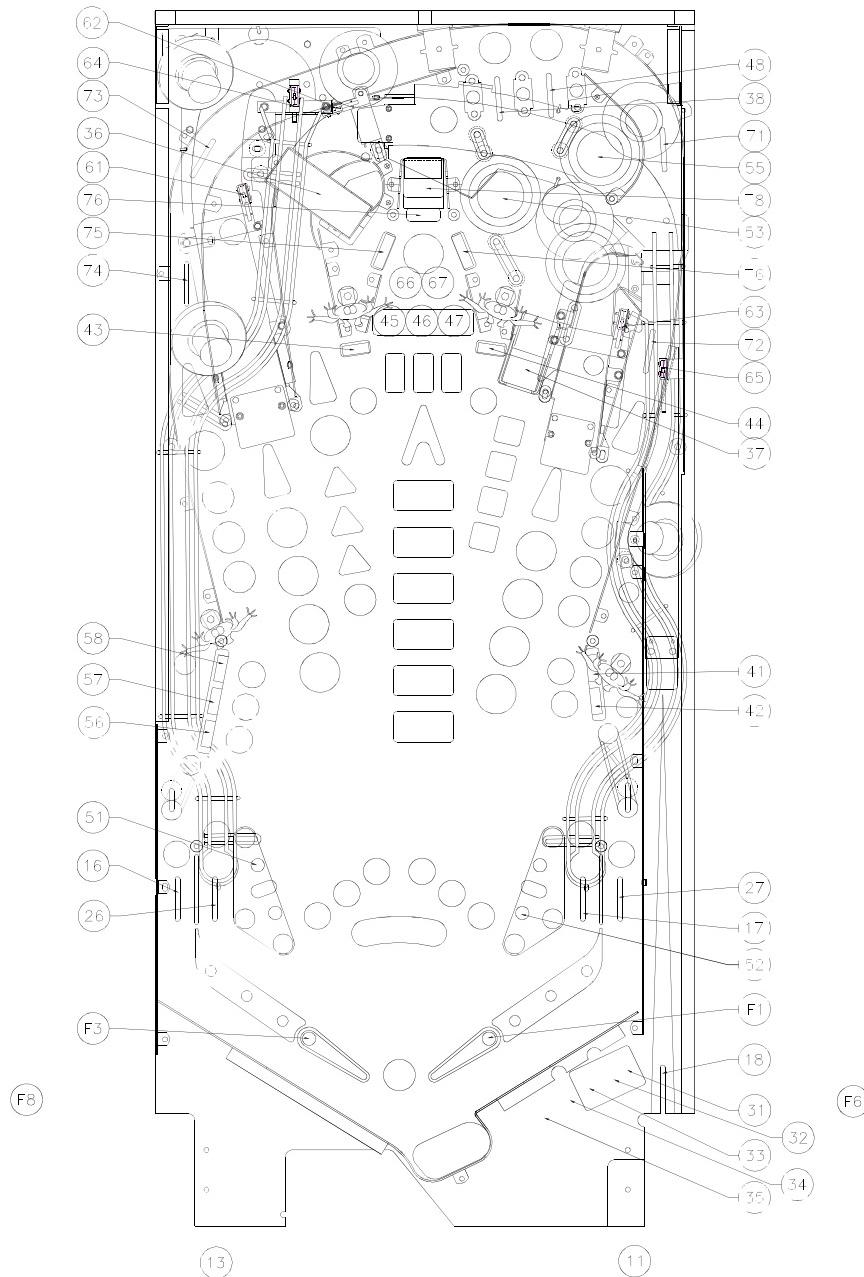


Flipper Opto input circuit



Typical switch input circuit

## SWITCH LOCATIONS (continued)



Item No.	Switch Part No.	Description	Item No.	Switch Part No.	Description
51	SW-1A-114	Left Slingshot (Kicker)	64	5647-12693-21	Left Ramp Exit
	SW-1A-120	(Score)	65	5647-12693-13	Right Ramp Exit
52	SW-1A-114	Right Slingshot (Kicker)	66	5647-12693-06	Motor Bank Down
	SW-1A-120	(Score)	67	5647-12693-06	Motor Bank Up
53	SW-11A-37-1	Left Jet	68	---	Not Used
54	SW-11A-37-1	Bottom Jet	71	5647-12693-19	Right Loop High
55	SW-11A-37-1	Right Jet	72	5647-12693-19	Right Loop Low
56	A-18018-21	"M"ARTIAN Target	73	5647-12693-19	Left Loop High
57	A-18018-21	M"A"RTIAN Target	74	5647-12693-19	Left Loop Low
58	A-18018-21	MA'R'TIAN Target	75	A-20784-4	Left Saucer Target
61	5647-12693-11	Left Ramp Enter	76	A-20784-4	Right Saucer Target
62	5647-12693-11	Center Ramp Enter	77	5647-12693-31	Drop Targets
63	5647-12693-11	Right Ramp Enter	78	5647-12693-26	Center Trough
			81-88	---	Not Used

\*Not Shown

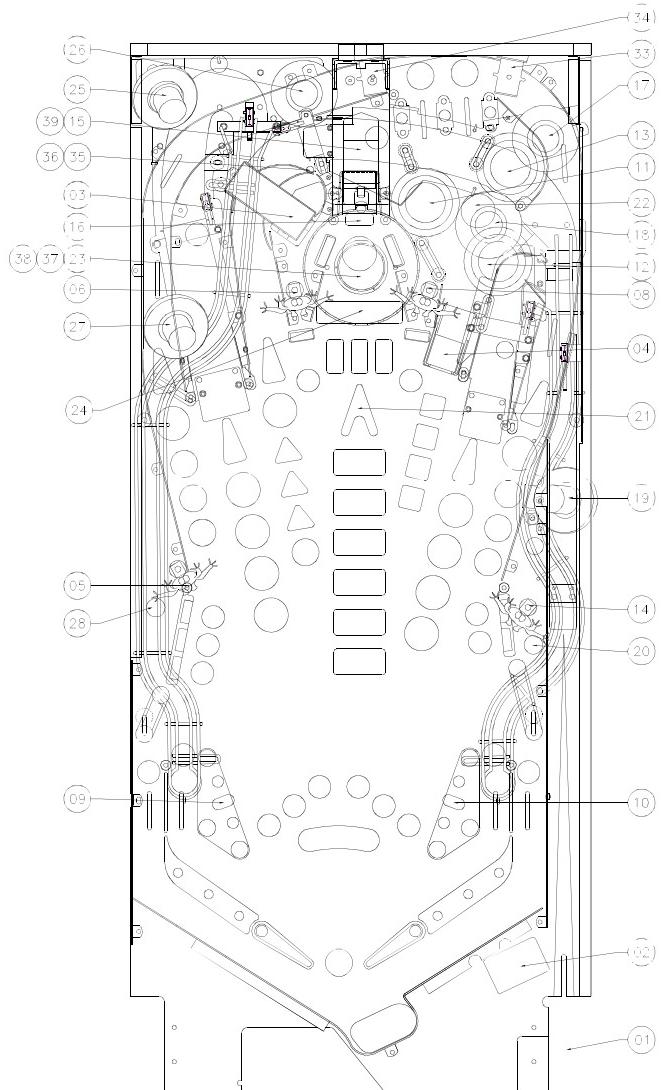
Attack From Mars Solenoid - Flasher Table							
WMS#	Solenoids	Driver Brd	FET#	Con.	FUSE	WIRE COLOR	PART#
01	AUTO PLUNGER	SP	Q101	J116p1	F103	VIO-WHT	AE-23-800
02	TROUGH EJECT	SP	Q102	J116p2	F103	VIO-RED	AE-26-1500
03	LEFT POPPER	SP	Q103	J116p3	F103	VIO-ORG	AE-26-800
04	RT POPPER	SP	Q104	J116p4	F103	VIO-YEL	AE-25-1000
05	LEFT ALIEN LOW	SP	Q105	J116p6	F103	VIO-GRN	AE-26-1500
06	LEFT ALIEN HIGH	SP	Q106	J116p7	F103	VIO-BLU	AE-26-1500
07	KNOCKER	SP	Q107	J115p2	F103	BRN	AE-23-800
08	RT ALIEN HIGH	SP	Q108	J116p9	F103	VIO-BLK	AE-26-1500
09	LEFT SLINGSHOT	SP	Q109	J113p1	F107	BRN-BLK	AE-26-1200
10	RT SLINGSHOT	SP	Q110	J113p2	F102	BRN-RED	AE-26-1200
11	LEFT JET	SP	Q111	J113p4	F102	BRN-ORG	AE-26-1200
12	BOTTOM JET	SP	Q112	J113p5	F102	BRN-YEL	AE-26-1200
13	RIGHT JET	SP	Q113	J113p6	F102	BRN-GRN	AE-26-1200
14	RT ALIEN LOW	SP	Q114	J113p7	F102	BRN-BLU	AE-26-1500
15	SAUCER SHAKE	SP	Q115	J113p8	F107	BRN-VIO	AE-26-1500
16	DROP TARGET	SP	Q116	J113p9	F107	BRN-WHT	AE-26-1200
FLASHERS							
17	RIGHT RAMP HIGH BB Insert	PF	Q40A	J12 p5		PIN-PCB-TWSFLSH PIN-PCB-BBFLASH	
18	RIGHT RAMP LOW BB Insert	PF	Q40B	J12 p6		PIN-PCB-TRUFLSH PIN-PCB-BBFLASH	
19	RIGHT SIDE HIGH BB Insert	PF	Q41A	P96 p4		PIN-PCB-TWSFLSH PIN-PCB-BBFLASH	
20	RIGHT SIDE LOW	PF	Q41B	P97 p4		PIN-PCB-TWSFLSH	
21	CENTER ARROW	PF	Q42B			PIN-PCB-TRUFLSH	
22	JETS	PF	Q33A	PL71		PIN-PCB-TWSFLSH	
23	SAUCER DOME	PF	Q43A	J14 p7		PIN-PCB-TWSFLSH	
24	MOTOR BANK	PF	Q51	P97		PIN-PCB-MOTFLSH	
25	LEFT RAMP LEFT BB Insert	PF	Q46A	J6p10		PIN-PCB-TWSFLSH PIN-PCB-MARFLSH	
26	LEFT RAMP RIGHT BB Insert	PF	Q46B	J4 J4	WHT-ORG	AE-27-1200	
27	LEFT SIDE HIGH BB Insert	PF	Q47A	J9 Pin2	BLU-BLK	PIN-A-14406	
28	LEFT SIDE LOW	PF	Q47B	PL5	BLU-YEL	PIN-A-14406	
33	RIGHT GATE	PF	Q48A	J6 Pin9 F1	BLU-YEL	PIN-A-14406	
34	LEFT GATE	PF	Q48B	J6 Pin10 F1	BLU-YEL	PIN-A-14406	
37	LED CLOCK	PF	U10p6	J14 p3			
38	LED R DATA	PF	U10p8	J14 p4			
	LED G DATA	PF	U10p12	J14 p6			
	LED B DATA	PF	U10p10	J14 p5			
39	STROBE LIGHT	PF	Q49B	J14 p8			
FLIPPERS							
29	FLIPPER RIGHT POWER	1	Q124	J119	F116	GRA-RED	FL-11629
30	FLIPPER RIGHT HOLD	1	Q131	J119	F116	GRA-BLK	Blue
31	FLIPPER LEFT POWER	1	Q125	J119	F115	GRA-YEL	FL-11629
32	FLIPPER LEFT HOLD	1	Q132	J119	F115	GRA-WHT	Blue
33	NU	3	Q126	J120	F118	BRN	FL-11753
34	NU	3	Q134	J120	F118	BLU	Yellow
35	DIVERTER POWER	2	Q128	J120	F117	BRN	FL-11753
36	DIVERTER HOLD	2	Q136	J120	F117	BLU	Yellow
GENERAL ILLUMINATION							
01	BOTTOM PLAYIELD	PF	Q42A	P93 P93B	WHT-BRN	---	---
02	MIDDLE PLAYIELD	PF	Q42B	P94 P94B	WHT-ORG	---	---
03	TOP PLAYIELD	PF	Q43A	P95 P95B	WHT-YEL	---	---
04	TOP INSERT	CONTRLR	Q5A	J4 P9	RED-GRN	PIN-PCB-24LEDBR	
05	BOTTOM INSERT	CONTRLR	Q7A	J4 P13	BLK-YEL	PIN-PCB-24LEDBR	

### SOLENOID/FLASHER LOCATIONS

Item No.	Coil/ Flasher No.	Assy. Number	Description	Item No.	Coil/ Flasher No.	Assy. Number	Description
01	AE-23-800	A-14525	Auto Plunger	09	AE-26-1200	B-9362-L-2	Left Slingshot
02	AE-26-1500	A-19963-1	Trough Eject	10	AE-26-1200	B-9362-R-3	Right Slingshot
03	AE-26-800	A-20633	Left Popper	11	AE-26-1200	A-9415-2	Left Jet
04	AE-25-1000	A-20573	Right Popper	12	AE-26-1200	A-9415-2	Bottom Jet
05	AE-26-1500	A-20579-1	Left Alien Low	13	AE-26-1200	A-9415-2	Right Jet
06	AE-26-1500	A-20579-2	Left Alien High	14	AE-26-1500	A-20579-1	Right Alien Low
07	AE-23-800	B-10686-1	Knocker	15	AE-26-1500	A-20608	Saucer Shake
08	AE-26-1500	A-20579-1	Right Alien High	16	AE-26-1200	A-20657	Drop target

\*NOT SHOWN

## Solenoid/Flasher Locations (continued)



Item No.	Coil/Flasher No.	Assy. Number.	Description	General Illumination Circuits		Bulb No.
				Item No.	Description	
17	24-8802	A-20621	Right Ramp High (2)	01	Bottom Playfield	#44, #555 G.I. String 1
18	24-8802	A-20621	Right Ramp Low (2)	02	Middle Playfield	#44, #555 G.I. String 2
19	24-8802	A-20549	Right Side High (2)	03	Top Playfield	#44, #555 G.I. String 3
20	24-8704	A-17983	Right Side Low	04	Top Insert	#555 G.I. String 4
21	24-8802	A-20624	Center Arrow	05	Bottom Insert	#555 G.I. String 5
22	24-8704	A-17803	Jets			
23	24-8802	A-20670	Saucer Dome			
24	14-8023	A-20572	Motor Bank			
25	24-8802	A-20553	Left Ramp Left			
26	24-8802	A-20553	Left Ramp Right			
27	24-8802	A-20546	Left Side High			
28	24-8704	A-17983	Left Side Low			
33	A-14406	A-17796	Right Gate			
34	A-14406	A-17796	Left Gate			
35	A-20099	A-17241	Divertor Power			
36	A-20099	A-17241	Divertor Hold			
37	---	A-20670	L.E.D. Clock			
38	---	A-20670	L.E.D. Data			
39	---	A-20718	Strobe Light			

Flipper Coils					
Item No.	Coil No.	Color	Assy. No.	Description	
29 & 30	FL-11629	Blue	A-15849-R-2	Lwr R Flipper	
31 & 32	FL-11629	Blue	A-15849-L-2	Lwr L Flipper	

## NOTES

# **SECTION THREE**

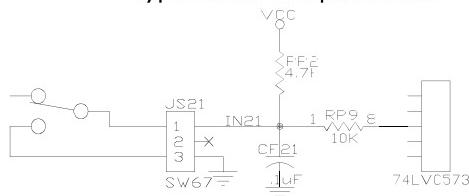
**GAME WIRING  
AND SCHEMATICS**

**Attack From Mars**  
**Switch Table (NOT A MATRIX)** Cabinet switches are read by CONTROLLER Board

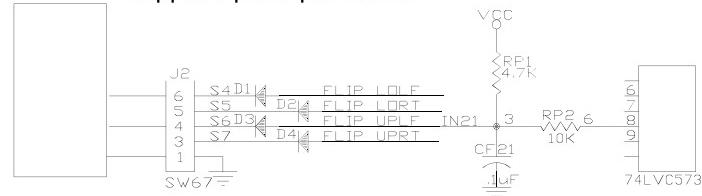
LEFT COIN J3p11 D1	LAUNCH BALL J2p9 U3p3	NOT USED 11	TROUGH EJECT JS31p8 U13p2	MARTI'A'N TARGET JS54 U15p5	LEFT SLINGSHOT J16p8 U12p4	LEFT RAMP ENTER J5p1 U16p2	RIGHT LOOP HIGH J8p9 U17p2	LOW RT FLIP EOS J10p6 U15p2
CENTER COIN J3p10 D2	NOT USED J2p7 --	COIN DOOR CLOSED 22	TROUGH BALL 1 JS31p7 U13p3	MARTIA'N TARGET JS55 U15p6	RIGHT SLINGSHOT J10p2 U12p6	CENTER RAMP ENTER J8p5 U17p5	RIGHT LOOP LOW J8p8 U17p3	LOW RT FLIP OPTO J2p5 U3p7
RIGHT COIN J3p9 D3	START BUTTON J2p10 U3p2	NOT USED 13	TROUGH BALL 2 JS31p6 U13p4	MAR'TIAN TARGET JS43p1 U14p4	LEFT JET J7p1 U15p9	RIGHT RAMP ENTER J8p7 U17p4	LEFT LOOP HIGH J6p4 U16p4	LOW LF FLIP EOS J16p10 U12p2
NOT USED D4	PLUMB BOB TILT J2p8 U3p4	ALWAYS CLOSED 14	TROUGH BALL 3 JS31p4 U13p5	MARTI'AN TARGET JS43p1 U14p4	BOTTO M JET J7p3 U13p7	LEFT RAMP EXIT J5p2 U16p3	LEFT LOOP LOW J6p3 U16p5	LOW LF FLIP OPTO J2p6 U3p6
ESCAPE SVC CRDT J3p7 D5	NOT USED J3p7	NOT USED 15	TROUGH BALL 4 JS31p3 U13p6	LEFT MOTOR BANK JS45p1 U14p6	RIGHT JET J7p4 U13p8	RIGHT RAMP EXIT J12p1 U17p9	LEFT SAUCER TARGET J6p2 U16p6	UP RT FLIP EOS Not Used F5
VOLUME DOWN J3p5 D6	LEFT OUTLANE J16p9 U12p3	LF RETURN LANE J16p7 U12p5	LEFT POPPER JS36p5 U10p3	CENTER MOTOR BANK JS45p2 U14p7	'M'ARTIAN TARGET JS26p1 U12p7	MOTOR BANK DOWN JS41p1 U14p2	RIGHT SAUCER TARGET J8p3 U17p7	UP RT FLIP OPTO J2p3 U3p9
VOLUME UP J3p4 D7	RT RETURN LANE J10p5 U15p3	RIGHT OUTLANE J10p3 U15p7	RIGHT POPPER JS37p5 U16p9	RIGHT MOTOR BANK JS45p3 U14p8	M'A'RTIAN TARGET JS27p1 U12p8	MOTOR BANK UP JS41p2 U14p3	DROP TARGET J8p2 U17p8	NOT USED F7
BEGIN TEST J3p3 D8	SHOOTER LANE J10p4 U15p4	NOT USED 18	LEFT TOP LANE J7p5 U15p8	RIGHT TOP LANE J8p10 U14p9	MA'R'TIAN TARGET JS67 U12p9	NOT USED 68	CENTER TROUGH J8p11 U16p8	UP LFT FLIP OPTO J2p4 U3p8

■ = Opto, Typically Closed

Typical switch input circuit



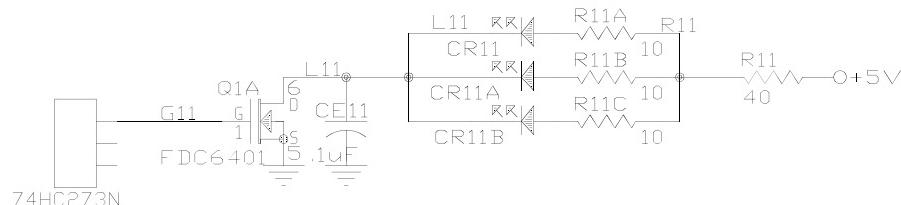
Flipper Opto input circuit



**Attack From Mars**  
**Lamp Table** (NOT A MATRIX) Cabinet lamp drivers are on the CONTROLLER Board

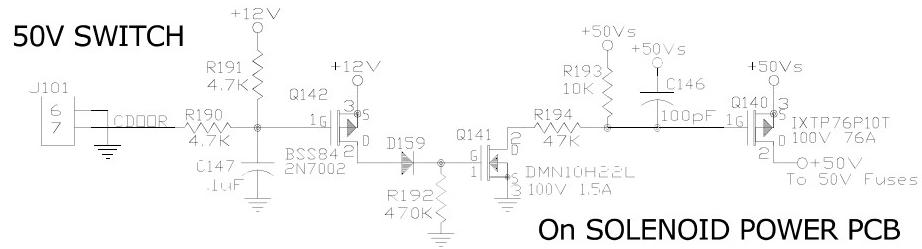
L11 Q1A	L21 Q6B	L31 Q10B	L41 Q15A	L51 Q24A	L61 Q28B	L71 Q32A	L81 Q35A
SUPER JETS	BIG-O-BEAM 1	TRACTOR BEAM 1	RIGHT LOOP ARROW	ATTACK MARS	FRANCOIS D'GRIMM	CAPTURE 1	SHOOT AGAIN J16p4
L12 Q1B	L22 Q6A	L32 Q11A	L42 Q13B	L52 Q24B	L62 Q29A	L72 Q33B	L82 Q36B
SUPER JACKPOT	BIG-O-BEAM 2	TRACTOR BEAM 2	CENTER RAMP ARROW	D.C. USA	KING OF PAYNE	CAPTURE 2	LEFT OUTLANE J16p3
L13 Q2A	L23 Q5B	L33 Q11B	L43 Q16A	L53 Q25A	L63 Q29B	L73 Q33A	L83 Q36A
MARTIAN ATTACK MULTIBALL	BIG-O-BEAM 3	TRACTOR BEAM 3	LEFT TOP LANE	LONDON ENGLAND	EARL OF EGO	CAPTURE 3	LEFT RETURN J16p2
L14 Q2B	L24 Q5A	L34 Q12A	L44 Q16B	L54 Q23B	L64 Q30A	L74 Q34B	L84 Q38A
ANNIHILATION	LEFT RAMP JACKPOT	RIGHT RAMP JACKPOT	RIGHT TOP LANE	LIGHT LOCK	LFT RAMP JACKPOT	LEFT LOOP JACKPOT PL91	RIGHT RETURN J10p9
L15 Q3A CR15	L25 Q7A	L35 Q12B	L45 Q14B	L55 Q23A	L65 Q30B	L75 Q34A	L85 Q38B
RETURN TO BATTLE	LEFT RAMP ARROW	RIGHT RAMP ARROW	LEFT MOTOR BANK	LOCK 1 +J8p1 J8p4	REVOLTING PEASANTS!	LEFT LOOP ARROW	RIGHT OUTLANE
L16 Q3B	L26 Q7B	L36 Q9B	L46 Q14A	L56 Q25B	L66 Q28A	L76 Q31B	L86 Q2A
CONQUER MARS	LOCK 2	MARTIAN ATTACK	CENTER MOTOR BANK	PISA ITALY +J8p2 J8p3	RIGHT LOOP JACKPOT	'M'ARTIAN TARGET	LAUNCH BUTTON J2p13
L17 Q4A	L27 Q8A	L37 Q10A	L47 Q15B	L57 Q26A	L67 Q27B	L77 Q31A	L87
5-WAY COMBO	LOCK 3	RULE UNIVERSE	RIGHT MOTOR BANK	BERLIN GERMANY	EXTRA BALL	M'A'RTIAN TARGET	NOT USED
L18 Q4B	L28 Q8B	L38 Q9A	L48 Q13A	L58 Q26B	L68 Q27A	L78 Q32B	L88 Q1B
DROP TARGET	CENTER RAMP JACKPOT	STROKE OF LUCK	MAR'T'IAN TARGET	PARIS FRANCE	MART'I'AN TARGET	MA'R'TIAN TARGET J6p8	START BUTTON J2p12
GI LED#	PF Left	GI1 P93	BROWN	GI2 P94B	ORANGE	GI3 P95B	YELLOW
SOCKET#	PF Right	Q42A P93B	WHT-BRN	Q42B P94	WHT-ORG	Q43A P95	WHT-YEL

**Typical Lamp circuit**

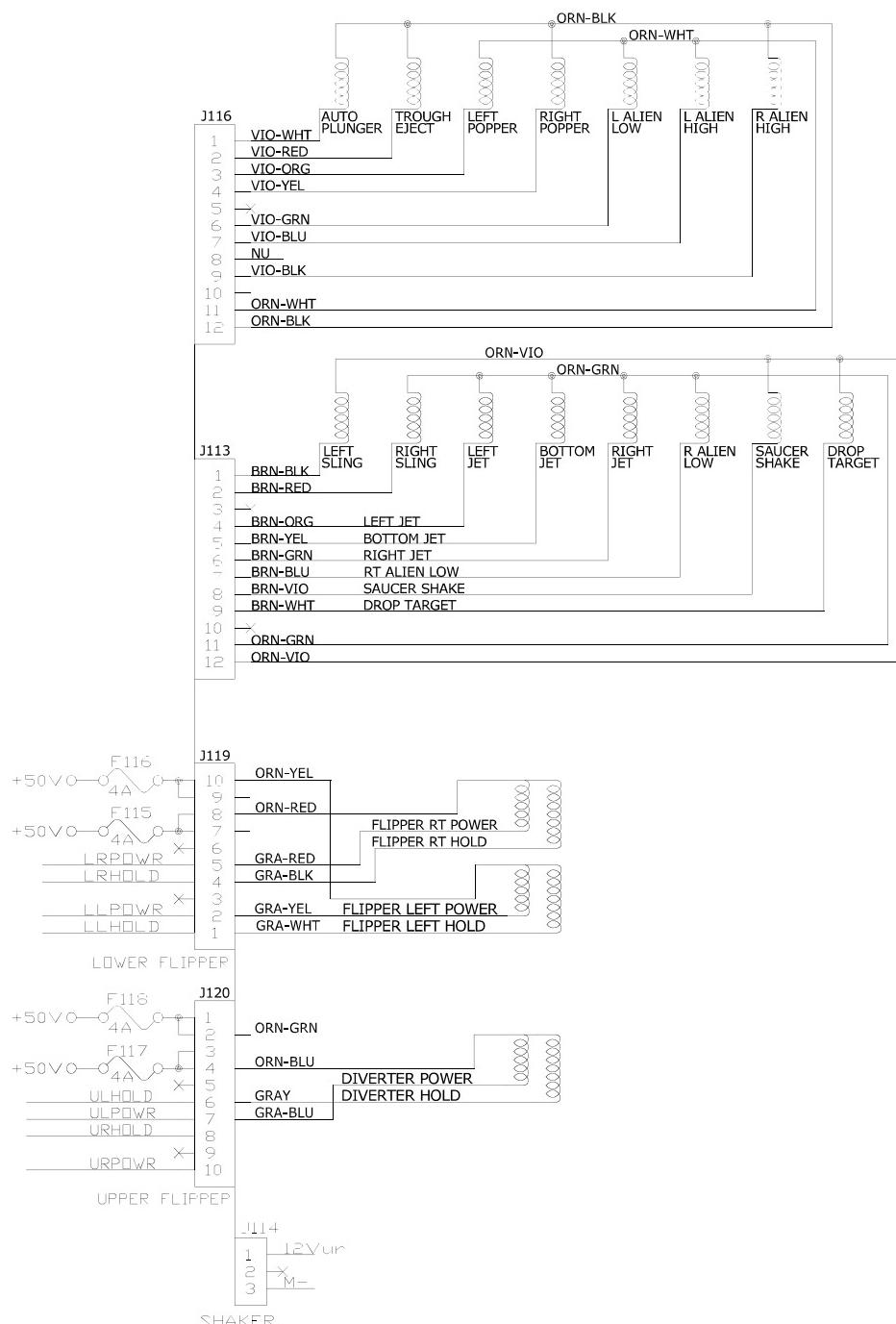


Attack From Mars Solenoid - Flasher Table							
WMS#	Solenoids	Driver Brd	FET#	Con.	FUSE	WIRE COLOR	PART#
01	AUTO PLUNGER	SP	Q101	J116p1	F103	VIO-WHT	AE-23-800
02	TROUGH EJECT	SP	Q102	J116p2	F103	VIO-RED	AE-26-1500
03	LEFT POPPER	SP	Q103	J116p3	F103	VIO-ORG	AE-26-800
04	RT POPPER	SP	Q104	J116p4	F103	VIO-YEL	AE-25-1000
05	LEFT ALIEN LOW	SP	Q105	J116p6	F103	VIO-GRN	AE-26-1500
06	LEFT ALIEN HIGH	SP	Q106	J116p7	F103	VIO-BLU	AE-26-1500
07	KNOCKER	SP	Q107	J115p2	F103	BRN	AE-23-800
08	RT ALIEN HIGH	SP	Q108	J116p9	F103	VIO-BLK	AE-26-1500
09	LEFT SLINGSHOT	SP	Q109	J113p1	F107	BRN-BLK	AE-26-1200
10	RT SLINGSHOT	SP	Q110	J113p2	F102	BRN-RED	AE-26-1200
11	LEFT JET	SP	Q111	J113p4	F102	BRN-ORG	AE-26-1200
12	BOTTOM JET	SP	Q112	J113p5	F102	BRN-YEL	AE-26-1200
13	RIGHT JET	SP	Q113	J113p6	F102	BRN-GRN	AE-26-1200
14	RT ALIEN LOW	SP	Q114	J113p7	F102	BRN-BLU	AE-26-1500
15	SAUCER SHAKE	SP	Q115	J113p8	F107	BRN-VIO	AE-26-1500
16	DROP TARGET	SP	Q116	J113p9	F107	BRN-WHT	AE-26-1200
FLASHERS							
17	RIGHT RAMP HIGH BB Insert	PF	Q40A	J12 p5		PIN-PCB-TWSFLSH PIN-PCB-BBFLASH	
18	RIGHT RAMP LOW BB Insert	PF	Q40B	J12 p6		PIN-PCB-TRUFLSH PIN-PCB-BBFLASH	
19	RIGHT SIDE HIGH BB Insert	PF	Q41A	P96 p4		PIN-PCB-TWSFLSH PIN-PCB-BBFLASH	
20	RIGHT SIDE LOW	PF	Q41B	P97 p4		PIN-PCB-TWSFLSH	
21	CENTER ARROW	PF	Q42B			PIN-PCB-TRUFLSH	
22	JETS	PF	Q33A	PL71		PIN-PCB-TWSFLSH	
23	SAUCER DOME	PF	Q43A	J14 p7		PIN-PCB-TWSFLSH	
24	MOTOR BANK	PF	Q51	P97		PIN-PCB-MOTFLSH	
25	LEFT RAMP LEFT BB Insert	PF	Q46A	J6p10		PIN-PCB-TWSFLSH PIN-PCB-MARFLSH	
26	LEFT RAMP RIGHT BB Insert	PF	Q46B	J4 J4	WHT-ORG	AE-27-1200	
27	LEFT SIDE HIGH BB Insert	PF	Q47A	J9 Pin2	BLU-BLK	PIN-A-14406	
28	LEFT SIDE LOW	PF	Q47B	PL5	BLU-YEL	PIN-A-14406	
33	RIGHT GATE	PF	Q48A	J6 Pin9 F1	BLU-YEL	PIN-A-14406	
34	LEFT GATE	PF	Q48B	J6 Pin10 F1	BLU-YEL	PIN-A-14406	
37	LED CLOCK	PF	U10p6	J14 p3			
38	LED R DATA	PF	U10p8	J14 p4			
	LED G DATA	PF	U10p12	J14 p6			
	LED B DATA	PF	U10p10	J14 p5			
39	STROBE LIGHT	PF	Q49B	J14 p8			
FLIPPERS							
29	FLIPPER RIGHT POWER	1	Q124	J119	F116	GRA-RED	FL-11629
30	FLIPPER RIGHT HOLD	1	Q131	J119	F116	GRA-BLK	Blue
31	FLIPPER LEFT POWER	1	Q125	J119	F115	GRA-YEL	FL-11629
32	FLIPPER LEFT HOLD	1	Q132	J119	F115	GRA-WHT	Blue
33	NU	3	Q126	J120	F118	BRN	FL-11753
34	NU	3	Q134	J120	F118	BLU	Yellow
35	DIVERTER POWER	2	Q128	J120	F117	BRN	FL-11753
36	DIVERTER HOLD	2	Q136	J120	F117	BLU	Yellow
GENERAL ILLUMINATION							
01	BOTTOM PLAYIELD	PF	Q42A	P93 P93B	WHT-BRN	PIN-LMP-GILEDWW	
02	MIDDLE PLAYIELD	PF	Q42B	P94 P94B	WHT-ORG	PIN-LMP-GILEDWW	
03	TOP PLAYIELD	PF	Q43A	P95 P95B	WHT-YEL	PIN-LMP-GILEDWW	
04	TOP INSERT	CONTRLR	Q5A	J4 P9	RED-GRN	PIN-PCB-24LEDBR	
05	BOTTOM INSERT	CONTRLR	Q7A	J4 P13	BLK-YEL	PIN-PCB-24LEDBR	

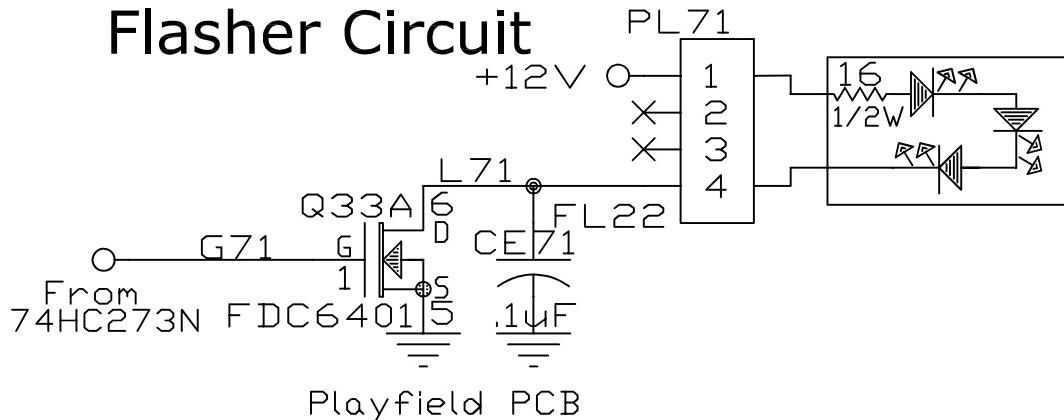
# SOLENOID WIRING



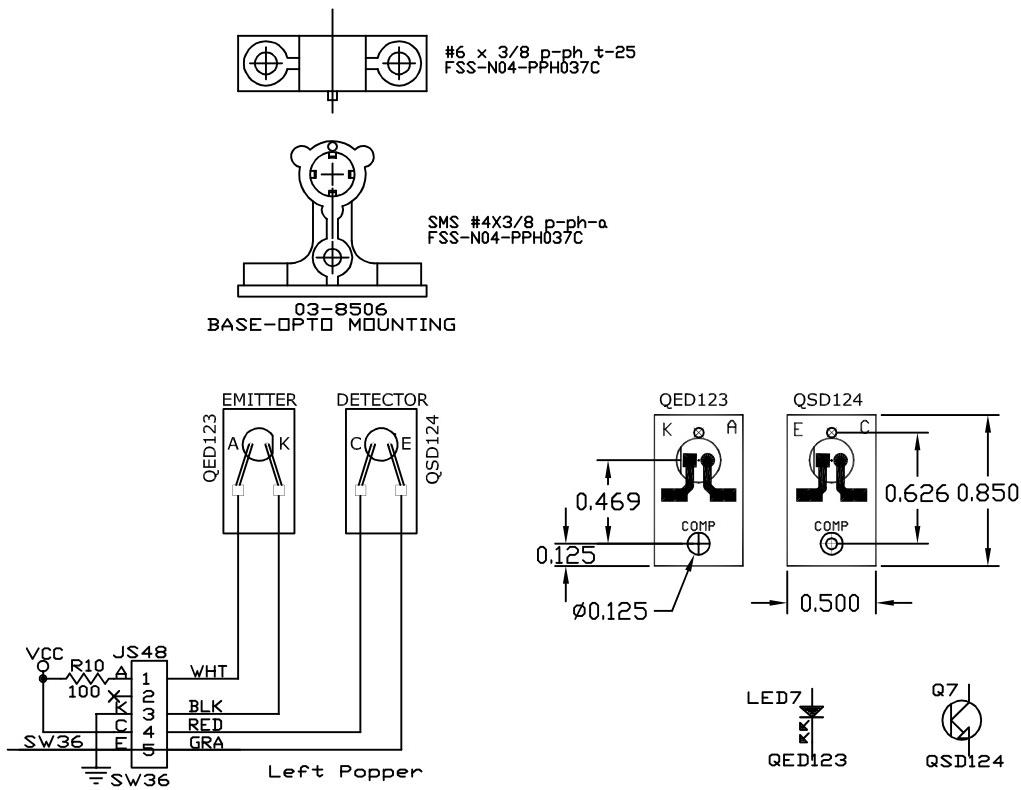
On SOLENOID POWER PCB



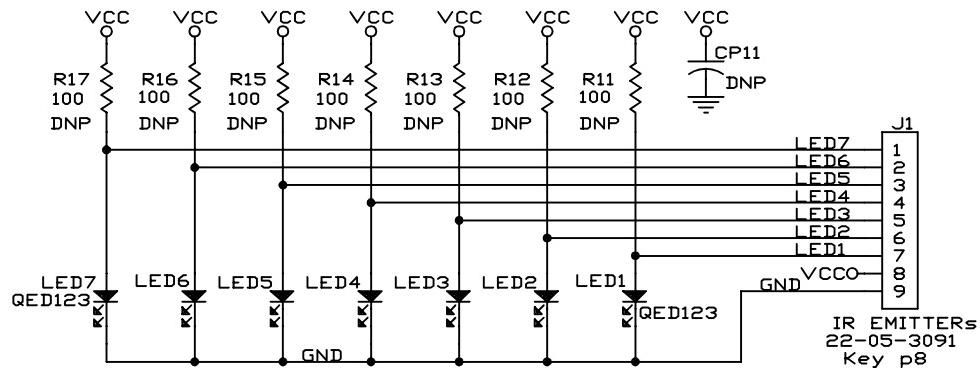
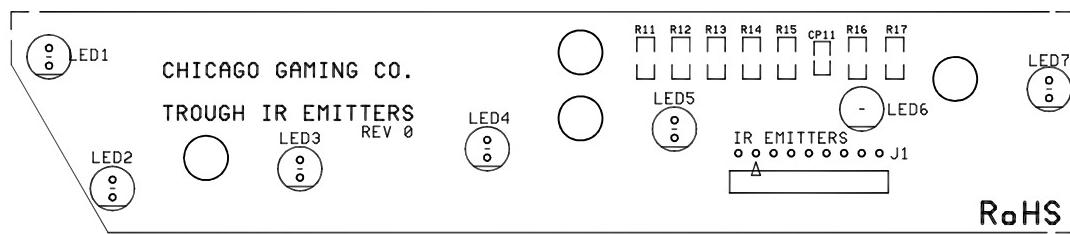
# Flasher Circuit



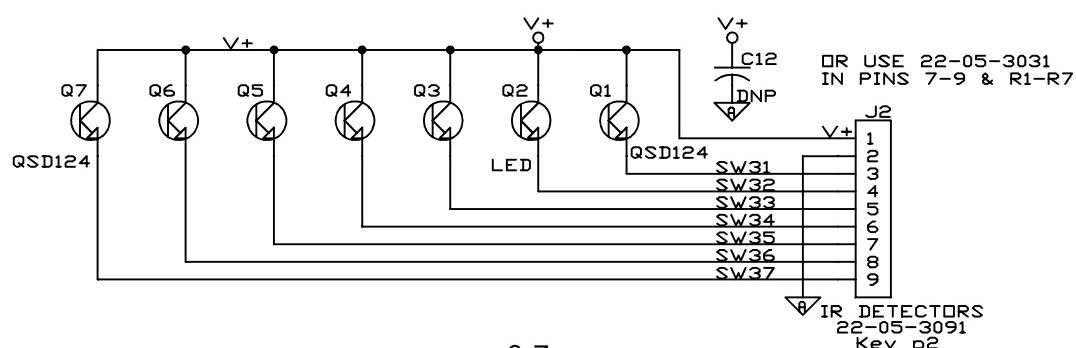
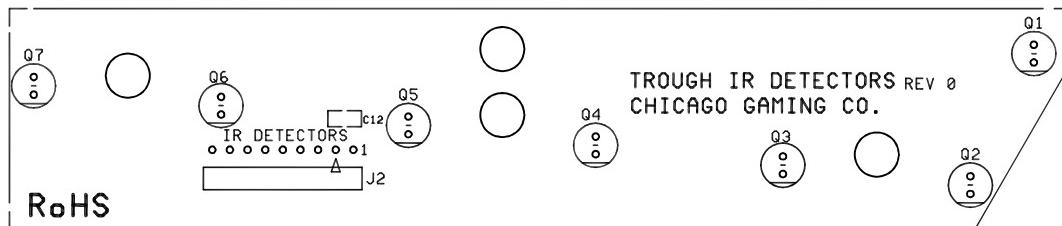
# Opto Circuit



# PIN-PCB-TRGHLED Trough IR LED PCB Assembly

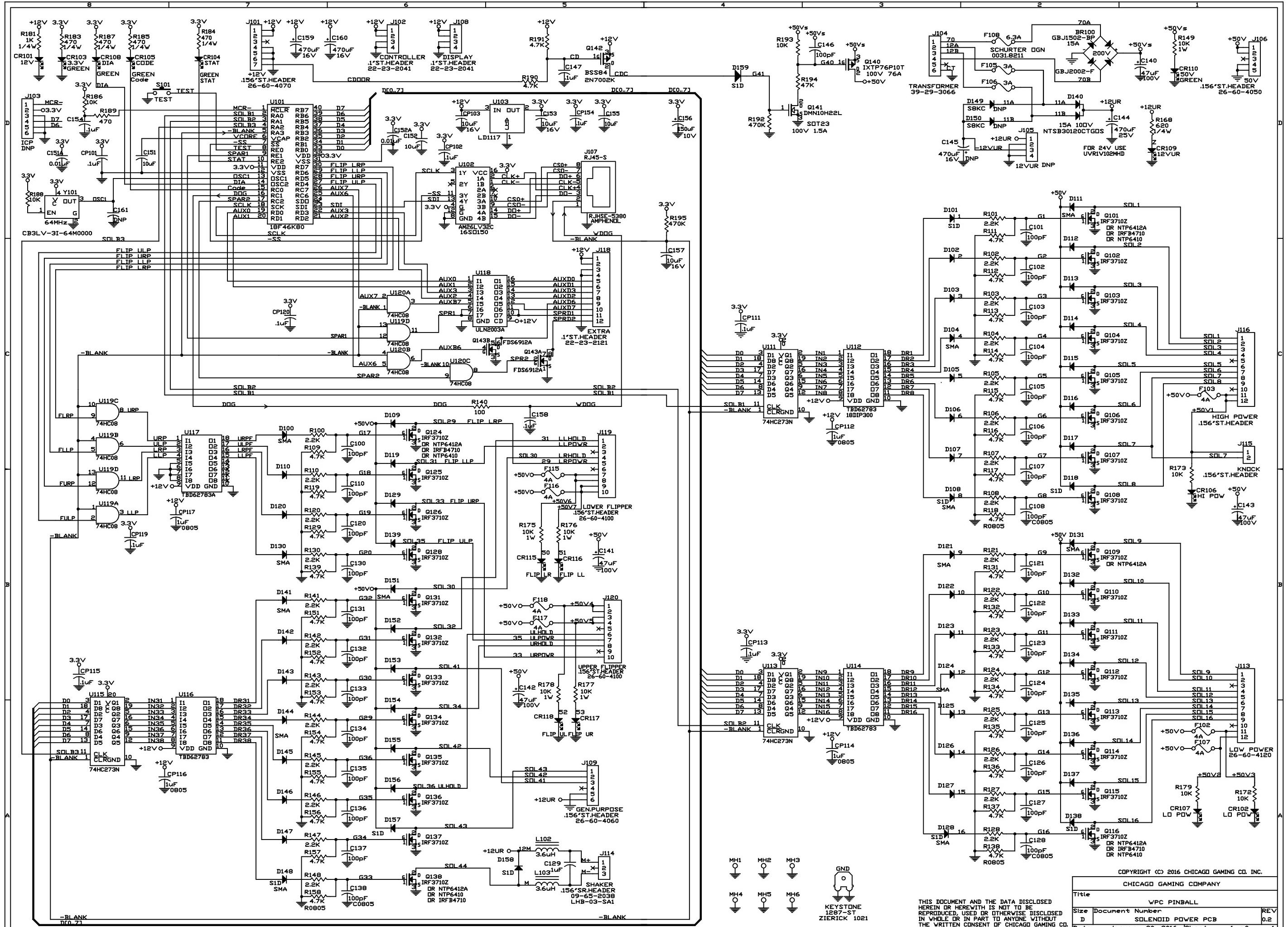


# PIN-PCB-TRGHDET Trough IR Photo Transistor PCB Assembly

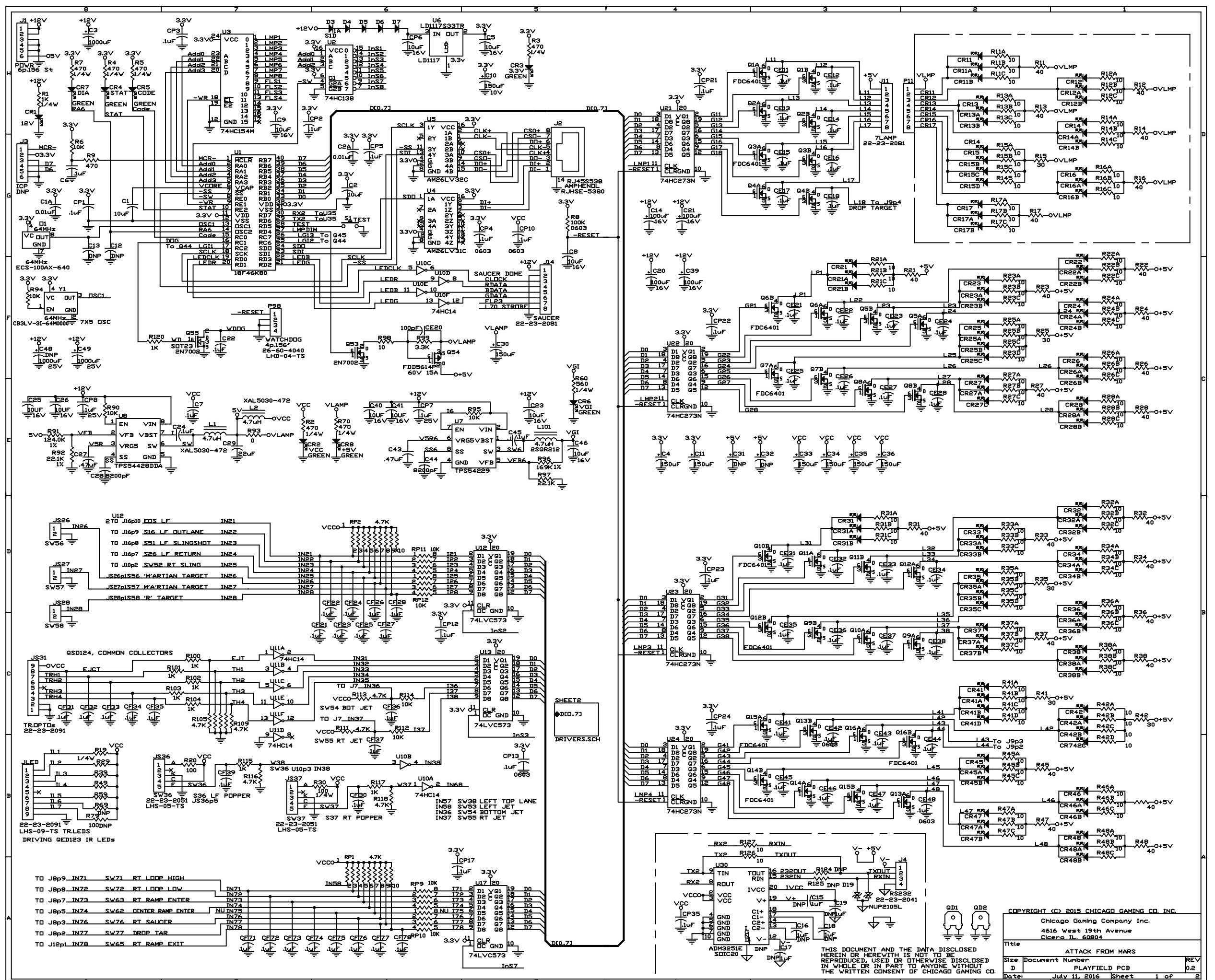


## NOTES

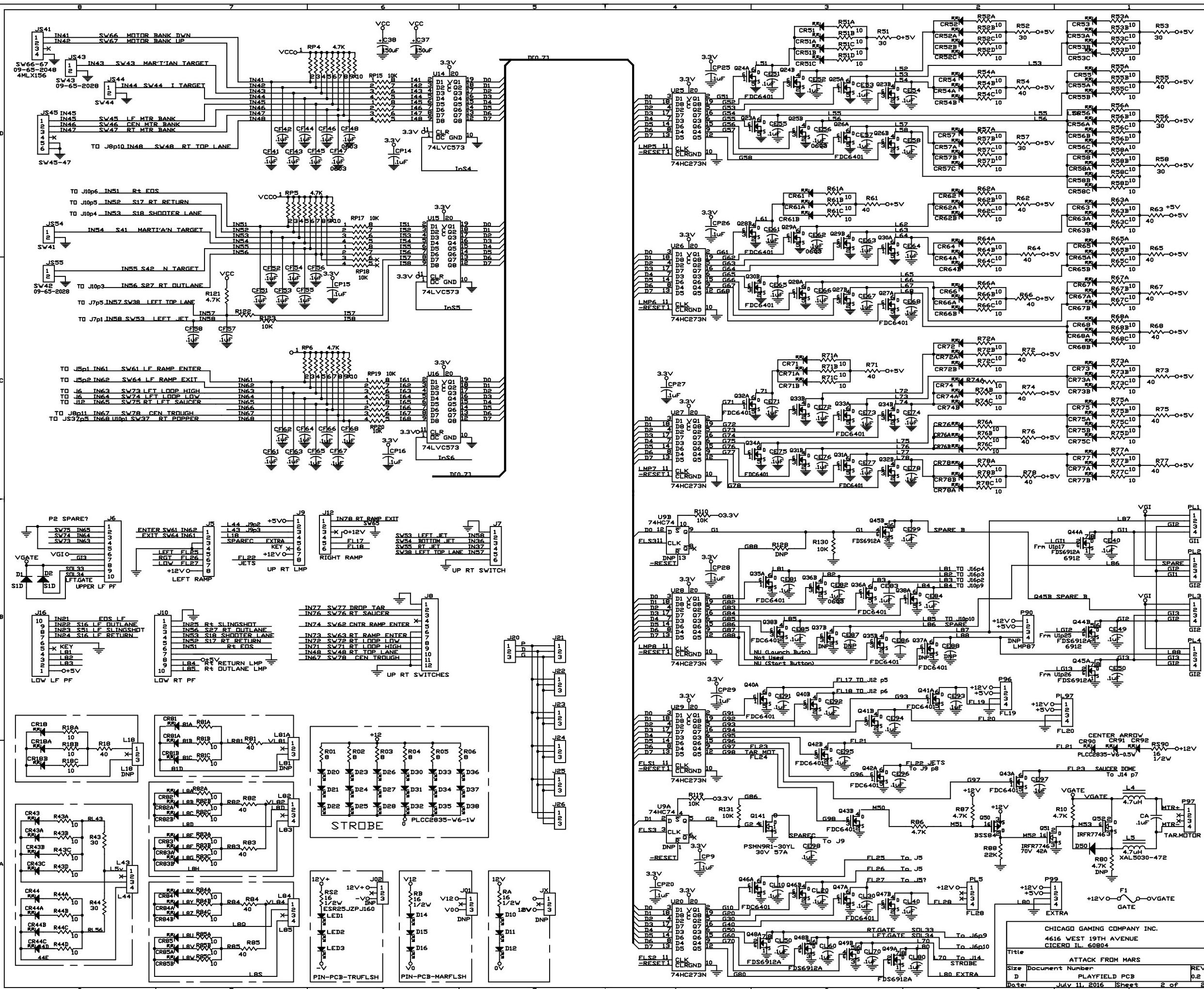
# **AFM Solenoid Board Schematic**



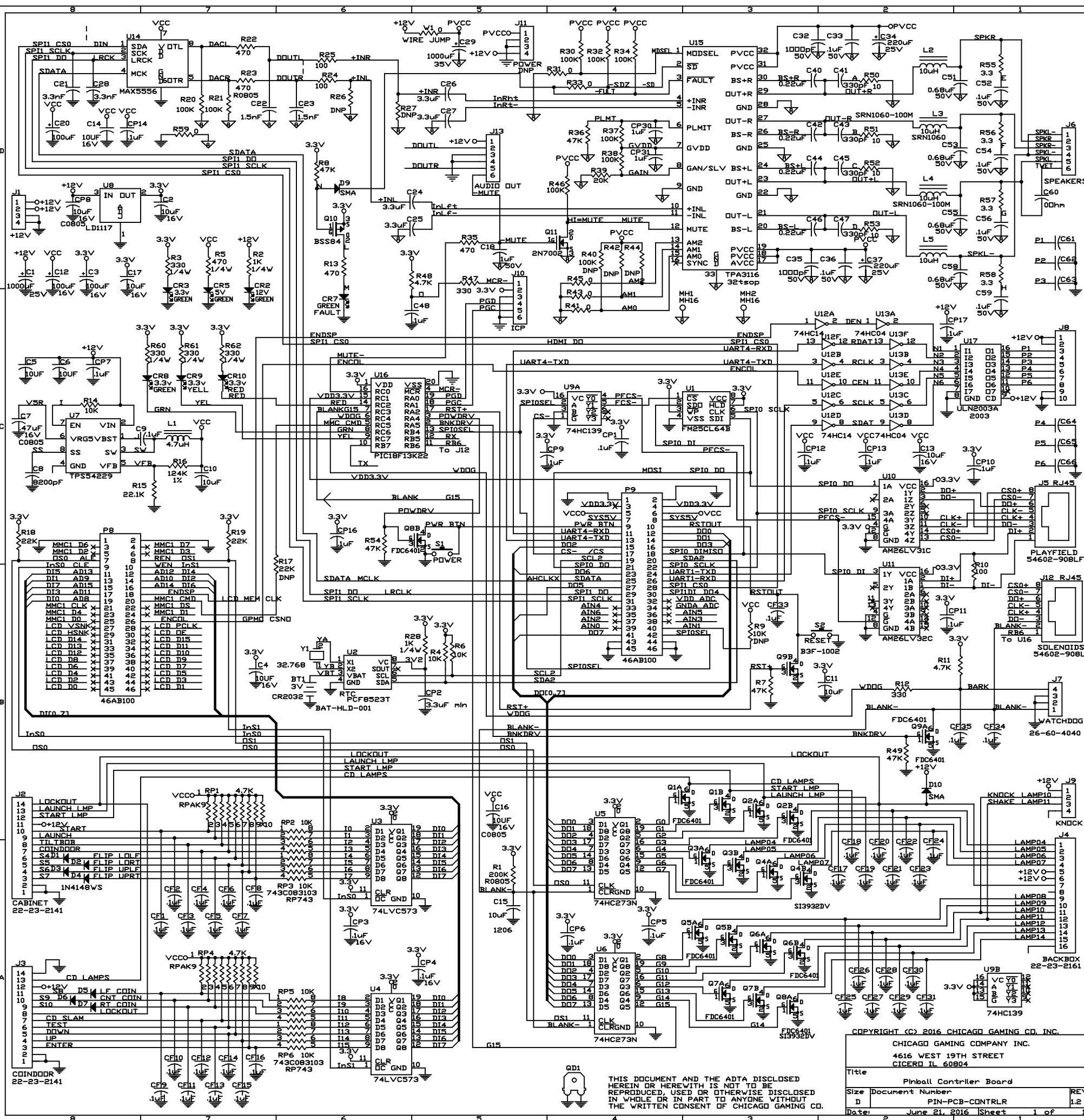
**AFM  
Playfield  
Board  
Schematic  
1 of 2**



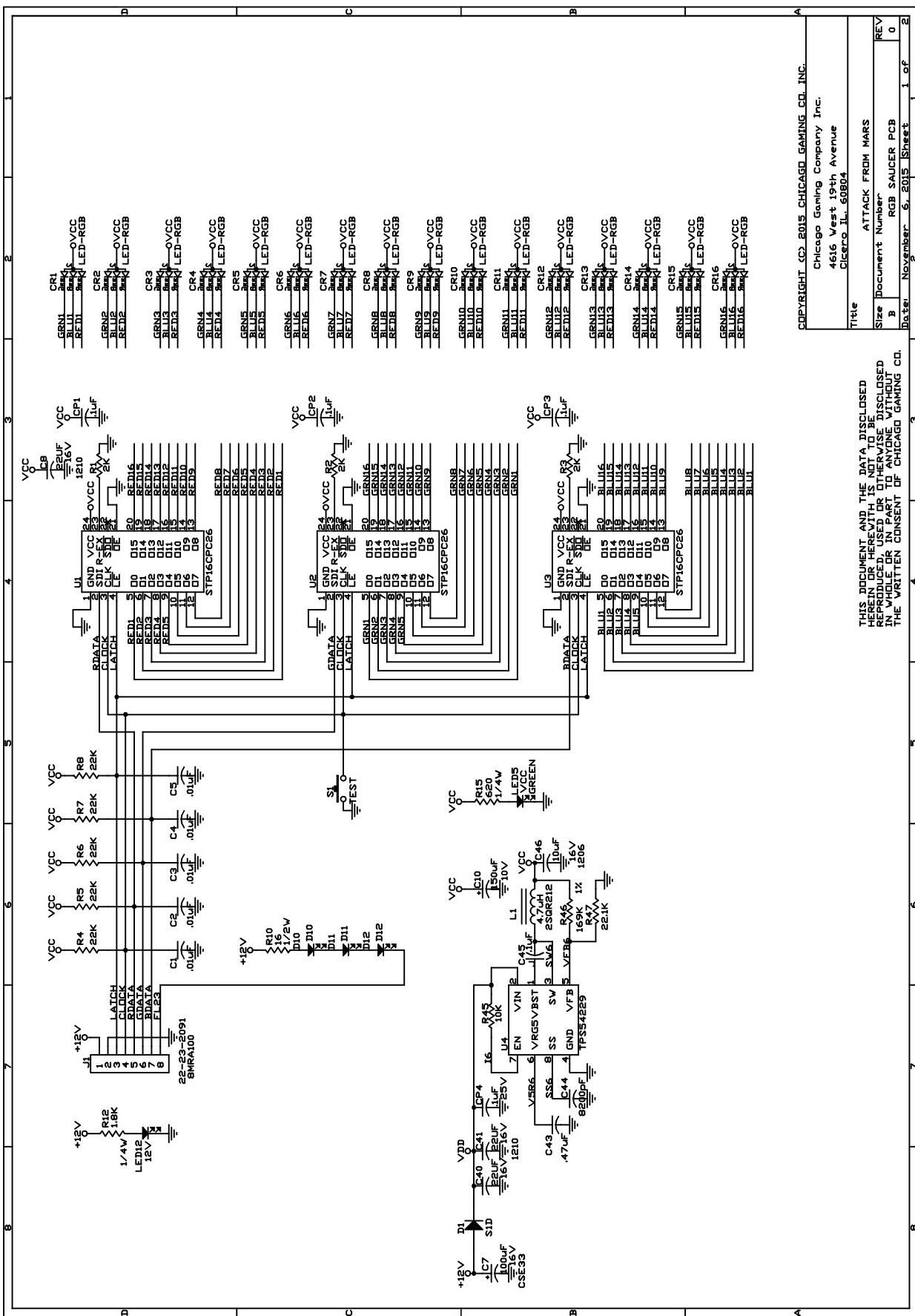
# AFM Playfield Board Schematic 2 of 2



**AFM  
Controller  
Board  
Schematic**



# Large Saucer PCB Schematic AFM-PCB-SAUCR16

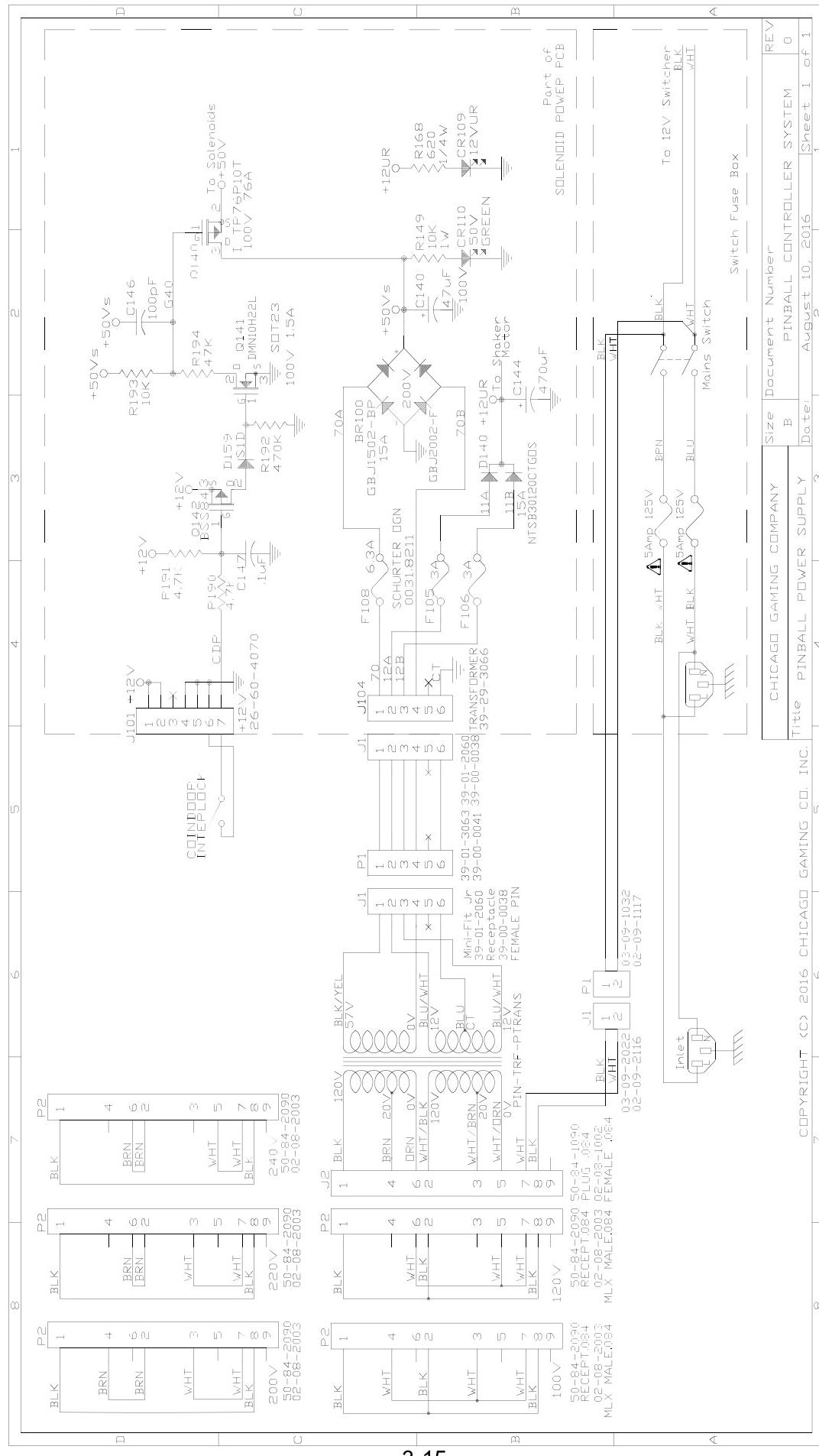


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Title	ATTACK FROM MARS
Size	Document Number
B	RGB SAUCER PCB
Date	November 6, 2015 Sheet 1 of 2



## AC Wiring





Attack From Mars								
Lamp Table (NOT A MATRIX) Cabinet lamp drivers are on the CONTROLLER Board								
L11 Q1A SUPER JETS	L21 Q6B BIG-O-BEAM 1	L31 Q10B TRACTOR BEAM 1	R41 Q15A RIGHT LOOP ARROW	L51 Q24A ATTACK MARS	L61 Q28B FRANCOIS D'GRIMM	L71 Q32A CAPTURE 1	L81 Q35A SHOOT AGAIN J16p4	
L12 Q1B SUPER JACKPOT	L22 Q6A BIG-O-BEAM 2	L32 Q11A TRACTOR BEAM 2	L42 Q13B CENTER RAMP ARROW	L52 Q24B D.C. USA	L62 Q29A KING OF PAYNE	L72 Q33B CAPTURE 2	L82 Q36B LEFT OUTLANE J16p3	
L13 Q2A MARTIAN ATTACK MULTIBALL	L23 Q5B BIG-O-BEAM 3	L33 Q11B TRACTOR BEAM 3	L43 Q16A LEFT TOP LANE	L53 Q25A LONDON ENGLAND	L63 Q29B EARL OF EGO	L73 Q33A CAPTURE 3	L83 Q36A LEFT RETURN J16p2	
L14 Q2B ANNIHILATION	L24 Q5A LEFT RAMP JACKPOT	L34 Q12A RIGHT RAMP JACKPOT	L44 Q16B RIGHT TOP LANE	L54 Q23B LIGHT LOCK	L64 Q30A LFT RAMP JACKPOT	L74 Q34B LEFT LOOP JACKPOT PL91	L84 Q38A RIGHT RETURN J10p9	
L15 Q3A CR15 RETURN TO BATTLE	L25 Q7A LEFT RAMP ARROW	L35 Q12B RIGHT RAMP ARROW	L45 Q14B LEFT MOTOR BANK	L55 Q23A LOCK 1 +J8p1 J8p4	L65 Q30B REVOLTING PEASANTS!	L75 Q34A LEFT LOOP ARROW	L85 Q38B RIGHT OUTLANE	
L16 Q3B CONQUER MARS	L26 Q7B LOCK 2	L36 Q9B MARTIAN ATTACK	L46 Q14A CENTER MOTOR BANK	L56 Q25B PIASA ITALY +J8p2 J8p3	L66 Q28A RIGHT LOOP JACKPOT	L76 Q31B 'M'ARTIAN TARGET	L86 Q2A LAUNCH BUTTON J2p13	
L17 Q4A 5-WAY COMBO	L27 Q8A LOCK 3	L37 Q10A RULE UNIVERSE	L47 Q15B RIGHT MOTOR BANK	L57 Q26A BERLIN GERMANY	L67 Q27B EXTRA BALL	L77 Q31A M'A'RTIAN TARGET	L87 NOT USED	
L18 Q4B DROP TARGET	L28 Q8B CENTER RAMP JACKPOT	L38 Q9A STROKE OF LUCK	L48 Q13A MARTIAN TARGET	L58 Q26B PARIS FRANCE	L68 Q27A MART'I'AN TARGET	L78 Q32B MA'R'TIAN TARGET J6p8	L88 Q1B START BUTTON J2p12	
GI LED# SOCKET#	PF Left PF Right	GI1 P93 Q42A P93B	BROWN WHT-BRN	GI2 P94 Q42B P94	ORANGE WHT-ORG	GI3 P95 Q43A P95	YELLOW WHT-YEL	

Attack From Mars								
Switch Table (NOT A MATRIX) Cabinet switches are read by CONTROLLER Board								
LEFT COIN J3p11 D1	LAUNCH BALL J2p9 U3p3	NOT USED 11	TROUGH EJECT JS31p8 U13p2	MARTI'A'N TARGET JS54 U15p5	LEFT SLINGSHOT J16p8 U12p4	LEFT RAMP ENTER J5p1 U16p2	RIGHT LOOP HIGH J8p9 U17p2	LOW RT FLIP EOS J10p6 U15p2 F1
CENTER COIN J3p10 D2	NOT USED --	COIN DOOR CLOSED J2p7 U13p3	TROUGH BALL 1 JS31p7 U13p3	MARTI'A'N TARGET JS55 U15p6	RIGHT SLINGSHOT J10p2 U12p6	CENTER RAMP ENTER J8p5 U17p5	RIGHT LOOP LOW J8p8 U17p3	LOW RT FLIP OPTO J2p5 U3p7 F2
RIGHT COIN J3p9 D3	START BUTTON J2p10 U3p2	NOT USED 13	TROUGH BALL 2 JS31p6 U13p4	MART'I'AN TARGET JS43p1 U14p4	LEFT JET J7p1 U15p9	RIGHT RAMP ENTER J8p7 U17p4	LEFT LOOP HIGH J6p4 U16p4	LOW LF FLIP EOS J16p10 U12p2 F3
NOT USED D4	PLUMB BOB TILT J2p8 U3p4	ALWAYS CLOSED 14	TROUGH BALL 3 JS31p4 U13p5	MART'I'AN TARGET JS43p1 U14p4	BOTTO M JET J7p3 U13p7	LEFT RAMP EXIT J5p2 U16p3	LEFT LOOP LOW J6p3 U16p5	LOW LF FLIP OPTO J2p6 U3p6 F4
ESCAPE SVC CRDT J3p7 D5	NOT USED --	NOT USED 15	TROUGH BALL 4 JS31p3 U13p6	LEFT MOTOR BANK JS45p1 U14p6	RIGHT JET J7p4 U13p8	RIGHT RAMP EXIT J7p4 U13p8	LEFT SAUCER TARGET J6p2 U16p6	UP RT FLIP EOS Not Used F5
VOLUME DOWN J3p5 D6	LEFT OUTLANE J16p9 U12p3	LF RETURN LANE J16p7 U12p5	LEFT POPPER JS36p5 U10p3	CENTER MOTOR BANK JS45p2 U14p7	'M'ARTIAN TARGET JS26p1 U12p7	MOTOR BANK DOWN JS41p1 U14p2	RIGHT SAUCER TARGET J8p3 U17p7	UP RT FLIP OPTO J2p3 U3p9 F6
VOLUME UP J3p4 D7	RT RETURN LANE J10p5 U15p3	RIGHT OUTLANE J10p3 U15p7	RIGHT POPPER JS37p5 U16p9	RIGHT MOTOR BANK JS45p3 U14p8	M'A'RTIAN TARGET JS27p1 U12p8	MOTOR BANK UP JS41p2 U14p3	DROP TARGET J8p2 U17p8	NOT USED F7
BEGIN TEST J3p3 D8	SHOOTER LANE J10p4 U15p4	NOT USED 18	LEFT TOP LANE J7p5 U15p8	RIGHT TOP LANE J8p10 U14p9	MA'R'TIAN TARGET JS67 U12p9	NOT USED 68	CENTER TROUGH J8p11 U16p8	UP LFT FLIP OPTO J2p4 U3p8 F8



= Opto, Typically Closed

